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ABSTRACT

This hearing addressed three major issues: How should copyright law respond to technological change? Should copyright law accommodate changes initiated outside the law, or attempt to delay change by preserving existing rights? and How should the legal dividing lines be drawn between the sometimes competing demands of consumer and proprietor? Statements and testimony from the following individuals and organizations are presented: (1) John F. Banzhaf, III, professor of law, George Washington University Law School; (2) Joseph F. Coates, president, J. F. Coates, Inc.; (3) Benjamin M. Compaine, executive director, Program on Information Resources Policy, Harvard University; (4) David Lange, professor of law, Duke University School of Law; (5) Frederick Weingarten, program manager, Communication and Information Technologies Program, Office of Technology Assessment; (6) Edward M. Cramer, president, Broadcast Music, Inc.; (7) Roy N. Freed; (8) Arthur J. Levine; and (9) Richard H. Stern. Four appendices include materials from the Congressional Copyright and Technology Symposium, Fort Lauderdale, FL, February 4-6, 1984; materials relating to an Office of Technology assessment study on intellectual property rights in the age of electronics and information; reprints of six articles; and judicial decisions and legislative materials. (JB)

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COPYRIGHT AND TECHNOLOGICAL CHANGE

HEARINGS

BEFORE THE

SUBCOMMITTEE ON COURTS, CIVIL LIBERTIES, AND THE ADMINISTRATION OF JUSTICE

OF THE

COMMITTEE ON THE JUDICIARY HOUSE OF REPRESENTATIVES

NINETY-EIGHTH CONGRESS

FIRST SESSION

ON

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JULY 20 AND 21, 1983

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COPYRIGHT AND TECHNOLOGICAL CHANGE

WEDNESDAY, JULY 20, 1983

House of Representatives,
Subcommittee on Courts, Civil Liberties,
and the Administration of Justice
of the Committee on the Judiciary,
Washington, DC.

The subcommittee met, pursuant to call, at 10:35 a.m., in room 2226, Rayburn House Office Building, Hon. Robert W. Kastenmeier (chairman of the subcommittee) presiding.

Present: Representatives Kastenmeier, Mazzoli, Schroeder, Glickman, Moorhead, DeWine, and Sawyer.

Staff present: Michael J. Remington, chief counsel; Deborah Leavy, counsel; Thomas E. Mooney, associate counsel; and Audrey K. Marcus, clerk.

Mr. **Kastenmeier**. The subcommittee will come to order.

Today, we inaugurate a series of oversight hearings on copyright and technological change.

In about 55 B.C., the Greek philosopher Heraclitus observed that "nothing endures but change." The proof of that statement is its truth today.

In our age, however, technology has accelerated the pace of change far beyond what Heraclitus might have dreamed.

It is easy to forget that the movie industry is only about 70 years old; the television industry is reaching its fourth decade; and communications satellites are in comparison mere infants.

We, as a society, are entering a new age. The fundamental shift from an industrial to an informational society is no longer just a prediction but is becoming a reality.

The majority of the American work force is engaged not in the production of goods but in the creation, processing, and distribution of information.

Expanding information technology, from computers to satellites, from television to teletype, insures that we will become even more of an information society in the future.

In this new society, it is predicted that information will be a key resource—the new capital. As the economic importance of information increases, the law of information—intellectual property law—assumes a critical function in shaping the new society.

Similarly, the first amendment, which insures that both our country and our governmental system are free and relatively open, occupies a central role.

We live in a society where creative ideas and thoughts are meant to compete with each other. Every resident of this country benefits from this relative openness.

Indisputably, the goals of Government are to preserve fundamental civil liberties and human rights, to insure equality among all citizens, and to protect private property.

As relates to intellectual property law, a key question is how should these goals best be reconciled. In this important regard, this subcommittee not only has jurisdiction and expertise in the area of copyright but is also competent to handle diverse civil liberties issues.

Not long ago, this subcommittee, with the assistance of able academicians, lawyers, and other distinguished experts, revamped the Copyright Law of 1909. The fruit of that labor was the Copyright Revision Act of 1976.

Yet, just a few Congresses later, science has advanced beyond what was then barely on the horizon. Today, several bills before the subcommittee attempt to accommodate some of these technological developments. Pending before us are bills which would extend copyright protection to semiconductor chips, mask works, and computer software; which would set forth a legal framework for home taping; which would modify the first sale doctrine for audio and video rental; and which would delineate rights in the area of cable television. We plan to address some of these issues in separate legislative hearings.

The semiconductor chip legislation will be the first to be considered at a field hearing in San Jose, Calif., on July 30, to be followed by another day of hearings back in Washington, D.C. on September 28.[1]

Record rental legislation, S. 32 and H.R. 1027, will be the subject of further hearings on October 13;[2] and video rental legislation, H.R. 1029, will be the subject of a hearing on October 27.

Cable television reform will be scrutinized by the subcommittee on October 20.

The subcommittee may also schedule a hearing on home taping during the fall period.

As we consider these bills, however, we must concern ourselves with larger issues. How should copyright law respond to technological change?

Should copyright law accommodate changes initiated outside the law, or should copyright law attempt to delay change by preserving existing rights?

How should the legal dividing lines be drawn between the sometimes competing demands of consumer and proprietor?

It goes without saying that Congress has an important role to play in answering these questions. What we do not know in this regard is what role should be played by other governmental entities within the executive and legislative branches.

Should new bureaucracies be created to solve problems or to reallocate resources?

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[1] Hearings were actually held August 3 and December 1, 1983, in Washington, D.C.
[2] Hearings held October 6, December 13, 1983.

In a time of finite budgetary resources, we must ask how much taxpayer money should be spent in the pursuit of legislative goals.

As the subcommittee with oversight responsibilities for the Federal judicial branch of Government, we know that the courts are overburdened by heavy caseloads and by the complexity of litigation.

With judicial review being a common feature of all copyright legislation, we need to know more about the role of courts in this area. Are courts doing a good job, or are specific issues that arise in the area of copyright and technology not amenable to judicial resolution? The *Universal* v. *Sony* litigation immediately comes to mind.

In short, the purpose of our hearings today and tomorrow is to refine these preliminary questions and to develop a body of knowledge and understanding that Congress can draw upon in the years to come.

Technology has accelerated what already has been referred to as the "ever whirling wheel of change," so that it is not enough to react to past events.

As Members of Congress, we must fulfill our role in helping to shape it for the betterment of all Americans.

I might also state parenthetically that this subcommittee has doubled in size, which accounts for the additional chairs before us. Nine members of this 14-member committee were not members of the subcommittee in the last Congress when we considered matters relating to copyright. I would hope that during the course of these hearings nearly all, if not all, members of the subcommittee will be in attendance.

Leading off, our first witness this morning is Dr. Benjamin Compaine, executive director of the program on information resources policy at Harvard University.

His career is as an observer in the communications industry. He is the author of six books on the subject. His current work focuses on the implications of changing technology, regulation, and economic and cultural factors for policymakers in industry and in Government.

Dr. Compaine, if you will please come forward, we are very pleased to greet you and have the benefit of your expertise. We have your statement and you may proceed from it, or however you care to.

TESTIMONY OF BENJAMIN M. COMPAINE, EXECUTIVE DIRECTOR, PROGRAM ON INFORMATION RESOURCES POLICY, HARVARD UNIVERSITY

Mr. COMPAINE. Thank you, Mr. Chairman.

It is my understanding that I was asked to testify today not as an authority on copyright but as a futurist. Futurist, however, has a vague, blue sky ring to it, and I do not presume to predict or know the future. Instead, I will try to lay out some of the forces and trends put in motion by the rapidly changing communications technology that you just described; and then suggest some of the possible policy implications of these developments.

My objective is to provide a context for your subsequent discussions of copyright. I have submitted a formal written statement which I request be included in the record of this hearing.

Mr. KASTENMEIER. Without objection, your formal statement will be received in the record.

Mr. COMPAINE. There was, not too long ago, a much simpler era in the media industries when a newspaper was a newspaper and television meant whatever the home receiver was able to pick up from one of the three commercial networks on the air.

Cable operators merely brought a piece of wire into the home so the same video image of what the networks were broadcasting might come in sharp, or come in at all, for many users.

By contrast, in the 1980's, participants in the media and allied arenas are facing a rapid change in technology and a blurring of the distinctions that have characterized the individual media.

For instance, the television set at home is being used for private showing of theatrical films or for displaying output from a distant computer; homes with cable service are able to view programing that is not available on the old line networks or, for that matter, anywhere off the air.

The talk today is of "narrowcasting," that is, special interest programing for identifiable market segments rather than the broadcasting which tried to appeal to the greatest mass of recipients.

The changing environment that makes a precise definition of the media arena difficult simultaneously creates a potential for new opportunities for those involved in the media industry.

It also should alert us to the possible entry of new competitors, such as computer firms and telephone companies, which have not been traditionally viewed as being in the media business or associated with what we call intellectual property.

This, then, may lead to new areas of conflict, not only in the marketplace, but among Government regulators seeking to identify their territories and the new forms of media and the participants.

The nature of such opportunities and threats is illustrated in some maps of the information business, which are included with my written testimony.

Since 1930, the center of this map, on pages 6 to 8 of that testimony, has become filled with businesses that have elements of content as well as processing and transmission of the content.

Today, the information business is composed increasingly of convergent industries, and the media industry is converging with previously distinct industries.

Given that terms that describe the media today, such as television or magazine, evoke connotations in most of us that may inhibit conceptualizing about the future of the media environment, our program has a classification that we try to substitute for those conventional terms.

The goal was to find a simple, yet comprehensive framework that could classify the various roles and functions of traditional as well as newer technologies we have called the media.

The framework combines pragmatic simplicity with reasonable inclusiveness, it includes three primary components: content, process, and format.

Organizations in the mass media or communications business are usually engaged in creating, transmitting, or processing information for display via one or more of several possible formats.

Let me elaborate a bit on this.

The content is the information—the intellectual property in most cases—that is provided by the supplier and received by the user.

Information as used here is broadly defined to encompass news, entertainment, music, commentary, advertising, numerical data, narration, and so forth—essentially anything that is transmitted by the design of a sender or at the request of a receiver.

Process refers to both the handling and transmitting of this content. Among the processing functions are gathering, creating, and storing information. This would include a newspaper reporter researching and writing an article, storing it on a floppy disc for editing, hyphenating and justification by a computer for typesetting and makeup.

Another example would be the activities leading to filming a movie, videotaping a tennis demonstration, or creating and providing an access to a computerized data base.

Examples of processing components are the transmission conduits, such as broadcasting, coaxial cable, mail and private parcel delivery, microwave, telephone and all those storage and handling modes that are included by computers, the printing press, and paper.

The third component of this scheme is format. This refers to the form in which the content is made available to the user or is handled by a processor. The format may be hard copy, such as printed words or pictures on paper. It may be an electronic visual presentation, such as that created on a video display tube, and that could be words as well as pictures.

It might be a mechanical visual presentation, such as that created by projecting movie film.

It may be an aural representation, such as the sounds created by a vibrating speaker cone.

And in many cases, several formats are combined, as in the case of most of the content that we see on the television set, which is both video and aural, and may include text.

Traditionally, the media have been defined primarily by the format, that is, newspaper, book, magazine, radio.

More recently, process names have been used to denote the medium, such as cable. Both cable and video cassette, for example, are merely alternative means to broadcasting for delivering content in a video and aural format.

Similarly, newspaper publishers may find in the near future that some of what they now put into paper as part of the traditionally printed product may be more efficiently delivered to the video terminals of only those subscribers requesting such information from the publisher's computer, such as classified ads or stock prices, or whatever.

The newspaper, therefore, may become a service using in part in-on-paper format and in part a video format. Increasingly, data base publishers have found that computer processing and video display of their content is an efficient and financially rewarding, in some cases, method of offering their services—although the content may be the same as which existed previously in the printed format.

Determining just what is content is far from clear, as seen in the computer software business. A floppy disc or other computer storage medium might have a program that enables users to create their own content. In that respect, a spread sheet program like VisiCalc is much like a business form.

But information, such as an article read via a computer terminal, has more in common with a traditional print magazine. Yet, both are classified today in the current jargon as "software."

Electronic publishing is already a reality. It involves allowing users at home or in the office access to content stored in computers.

To date, most of this content has been a repackaging of content originally prepared for print. Income received by publishers from electronically distributed content have been mostly considered extra revenue, much as video cassette revenue from motion pictures is still a relatively small portion of that income stream.

In the future, we may see an increasing volume of content created for and distributed primarily by electronic means. Among some speculative possibilities that various sources have suggested are some of these:

Some day, the newspaper, already processed and stored in computers in the publisher's plant today, could be "downloaded" during the night to storage media of subscribers via telephone or cable lines, instead of "rolling the press." The subscriber then views the newspaper on a portable flat, high resolution screen that could be carried to the porch, taken on the bus, or into the office.

Another example: Publishers could mass produce their content in the form of "read only memory," called ROM by the aficionados. These computer chips could store the equivalent of a book or a magazine. They would be sold in retail stores or shipped through the mail by mail order.

Another example: Books as well as archival information could be stored on optical video discs, for viewing also on television screens.

Another example: It is possible, though still not feasible, to have an ondemand, online video library. That is, the types of video and audio programs and films that today are distributed by cable or cassette, discs or broadcast, could be digitized and stored in a computer, much the way text is stored today.

Just as we call up text information on demand, so may the user at home request to see a particular movie or other program. Then, that viewer and only that viewer, can watch the movie, while other viewers are watching any other show they want to.

Thus, while today we think of 35 or 54 cable channels being filled simultaneously, in the future, a household might need only 2 or 3 cable channels because they will not have to choose from among the offerings provided by some programer, but view whatever they want to see, whenever they want to see it, from a library of computer-stored video programs.

Moreover, once digitized, individuals could create their own programs, by assembling pieces or scenes that producers could provide. For example, they might first select one of several opening scenes, then decide on a comic scene instead of a tragic scene, and so forth.

This sort of "create your own programing" is already being offered on some optical video discs.

Two more examples: Computers may be programed to do more than just be passive storage and transmission devices. They could receive the downloaded newspaper I described a few minutes ago and be programed to select only those types of articles that the individual subscriber likes to see. For example, the score of a local baseball team, any news about the airline industry, any want ads for used sailboats between 24 and 32 feet, and costing less than $40,000, whatever. One day, we may have computers that can take a written work and create its own original abstract from it.

Finally, publishers of reference works, such as encyclopedias, are already providing online access to users with home computers. As telephone transmission speeds get faster, some customers could decide to have the entire encyclopedia downloaded onto their own mass storage media. Then, after the one-time charge for this transmission, they would not have to pay continuing royalties to either the owner of the reference material or the service bureau that provides the computer facility. They could also make electronic copies to sell or just give to friends.

What are the implications of this for copyright?

The concept of copyright was not practical in a society when memory was the primary repository of records and creativity. Copyright was not enforceable in the pre-Gutenberg world when things were carried up in your head.

The modern notion of copyright is largely a function of the technology of the printing press. The printing press made possible centralized control of the production process for written works.

In the mid-19th century, a confluence of factors, including the steam-driven rotary press, made possible relatively cheap reproduction of print and led to the democratization of the consumption of intellectual property.

Most modern media forms—film, phonograph records, radio, television broadcasting—share with the printing press the mass production and distribution of many identical products, also relatively easily controlled by suppliers of the creative works. Thus, the print notion of copyright was readily transferable to these newer forms.

Today, we are looking at a substantial change in the nature of control. Starting with audio tapes and photocopying machines, we have seen a proliferation of inexpensive techniques for democratizing the production of intellectual property.

Video tape machines, floppy discs and other forms of computer-readable storage devices are making it easier for users of content to create, store, reproduce, and transmit intellectual property. But instead of making simply a faithful duplicate of the original, computer programs can tinker with the original content, creating an output that is fundamentally different from the content entered into the computer, yet, which was not specifically anticipated by the creator of the algorithms in the computer program.

These fundamental changes give rise to questions which may have to be addressed in the reconsideration of the nature of copyright. Among them are:

First, how does one measure which source has added what elements to creative work if the digital editing and duplication process leaves no visible trail, unlike penciled marginal notes?

Second, how, if at all, can duplication and transmission of electronic works by users in the home or office be measured?

Third, how can one tell the difference between a legally authorized copy and a "bootleg" copy, particularly when dealing with textual material that has come from the computer of the publisher to the computer of the user?

Fourth, what mechanisms can ascertain that creators of intellectual property be compensated for their contributions without stunting the development of technological tools that are expanding the process and format options available to these creators?

Finally, and perhaps most challenging, who is the author of original material created by a computer program, such as an abstract from a longer article? Is it the computer programer? Is it the author of the original article or book? Is it the owner of the computer? Or is it the computer?

To make things more complex, what if the programer whose programs create original material such as abstracts, sells or licenses the software to numerous publishers? Presumably, each of these publishers could produce an identical abstract, which in conventional terms we could say is subject to copyright.

However, if each of these publishers is using the same computer program to produce a word-for-word identical abstract or creative work, then perhaps the real nature of the copyright is in with the program, the algorithm and not the output of that computer.

The challenge for public policymakers is to construct laws and regulations that are flexible enough to respond to very uncertain technological developments and unpredictable market changes.

We can be relatively accurate in predicting what the technology already in existence or in laboratories makes possible. But wrong or premature regulation may stifle otherwise useful developments. Waiting too long to correct an inequity may result in the politically expedient necessity of having to grandfather many exceptions.

Thank you for the opportunity to participate in these hearings.

[The statement of Mr. Compaine follows:]

Remarks of Benjamin M. Compaine *
before the
Subcommittee on Courts, Civil Liberties
and the Administration of Justice
House Committee on the Judiciary
July 20, 1983

It is my understanding that I was asked to testify today not as an authority on copyright but as a "futurist". Futurist, however, has something of a vague, blue-sky ring to it. I do not presume to predict the future. Instead, I will try to lay out some of the forces and trends put in motion by rapidly changing communications technology and then suggest some of the possible policy implications of these developments. My objective is to provide a context for your subsequent discussions of copyright. I have submitted a formal written statement which I request be included with the record of this hearing.

There was, not too long ago, a simpler era for the media industries, when a newspaper was a newspaper and television meant whatever the home receiver was able to pick up from one of three commercial networks. Cable operators merely brought a piece of wire into a home so the video image of what the networks were broadcasting might come in sharp--or come in at all--for many users.

By contrast, in the 1980s, participants in the media and allied arenas are faced by a rapid change in technology and by the blurring of the distinction that has characterized the individual media. For

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* Executive Director, Program on Information Resources Policy, Harvard University. The Program is supported by about 120 organizations (list attached as Appendix A). These comments do not necessarily reflect the view of these organizations.

instance, the television set at home is being used for private showing of theatrical films or for displaying output from a distant computer; homes with cable service are able to view programming that is not available on the old-line networks or, for that matter, anywhere off the air. The talk today is of "narrowcasting," i.e., special interest programming for identifiable market segments rather than the broadcasting which tried to appeal to the greatest mass of recipients.

The changing environment that makes a precise definition of the media arena difficult simultaneously creates the potential for new opportunities for those involved in the media industry. It also should alert us to possible entry by new competitors, such as computer firms and telephone companies, which have not been traditionally viewed as being in the media business. This, then, may lead to new areas of conflict, not only in the marketplace, but among government regulators seeking to identify their territories and the new media forms and participants. The nature of such opportunities and threats is illustrated in Figures 1 through 3 (pages 6-8) of my written statement. These "maps" of the information business show the juxtaposition of its traditional segments.

Since 1930, however, the center of the map has become filled, with businesses that have elements of content as well as processing of content and/or transmission. Today, the information business is composed of increasingly convergent industries (Figure 3), and the media industry is converging with previously distinct industries.

AN ALTERNATIVE SCHEME FOR DESCRIBING THE MEDIA

Given that terms that describe the media today--like "television," "magazine," etc.—evoke connotations in most of us that may inhibit conceptualizing about the future media environment, the Program on Information Resources Policy has classification schemes that may be usefully substituted. The goal was to find a simple yet comprehensive framework which could classify the various roles and functions of traditional as well as newer technologies we have called the "media."

The framework we have settled upon, which combines pragmatic simplicity with reasonable inclusiveness, is outlined, roughly sketched, in Figure 4 (p.9 of my written statement). It consists of three primary components: content, process and format. Organizations engaged in the mass media or communications business are usually engaged in creating, transmitting or processing information for display via one or more of several possible formats.

The content is the information that is provided by the supplier and received by the user. Information, as used in this paper, is broadly defined to encompass news, entertainment, music, commentary, advertising, numerical data, narration, etc. — essentially anything that is transmitted by the design of a sender or at the request of a receiver. (I recognize that information has other meanings growing out of a variety of disciplines, but seek here to use the broadest possible description.)

Process refers to both the handling and transmitting of the information. Among the processing functions are gathering, creating, and storing information. This would include a newspaper reporter researching and writing an article, storing it on a floppy disc for editing, hyphenation and justification by a computer for typesetting and make-up. Another example would be the activities leading to filming a movie, videotaping a tennis demonstration, or creating and providing an access to a computerized data base.

Examples of processing components are the transmission conduits, such as broadcasting, coaxial cable, mail and private parcel delivery, microwave, telephone and the storage/handling modes that include computers, printing presses and paper.

Format, as used in this schema, refers to the form in which the content is made available to the user or is handled by a processor. This may be as hard copy, such as printed words or pictures on paper. It may be an electronic visual representation, such as that created on a video display tube, and could be as words as well as pictures. It may be a mechanical visual representation such as that created by projecting movie film or micro-materials. It may be an aural representation, such as the sounds created by a vibrating speaker cone. And in many cases, several formats are combined, as in the case of most of the content displayed through a television set.

Traditionally, the "media" have been defined primarily by their format—newspaper, book, magazine, radio. More recently, process names have been used to denote the medium, such as "cable," "videocassette," "home computer," etc. Both cable and video cassette, for example, are merely alternative means to broadcasting for delivering content in a video/aural format. Similarly, newspaper publishers may find in the near future that some of what they now put onto paper as part of the traditionally printed product may be more efficiently delivered to the video terminals of only those subscribers requesting such information from the publisher's computer (like classified ads or stock prices). The "newspaper," therefore, may become a service using in part an ink-on-paper format and in part a video format. Increasingly, data base publishers have found that computer processing and video display of their content is an efficient and financially rewarding method of offering their services—although the content may be the same as that which existed in a print format.

Determining just what is content is far from clear, as seen in the computer software business. A floppy disk or other computer storage medium might have a program that enables users to create their own content. In that respect, a spreadsheet program like VisiCalc is much like a business form. But information, such as an article read via a computer terminal, has more in common with a traditional print magazine. Yet both are classified as "software" in the current jargon.

FUTURE OF NEW PROCESSES AND FORMATS

Electronic publishing is already a reality. It involves allowing users at home or in the office access to content stored in computers. To date, most of this content has been a repackaging of content originally prepared for print. Income received by publishers from electronically distributed content have been mostly considered extra revenue, much as videocasette revenue from motion pictures is still a relatively small portion of that income stream.

In the future, we may see an increasing volume of content created for and distributed primarily by electronic means. Among some speculative possibilities that various sources have suggested:

—Someday, the daily newspaper, already processed and stored in computers in the publisher's plant, could be "downloaded" to storage media of subscribers during the night via telephone or cable lines, instead of "rolling the press." The subcriber then views the newspaper on a portable flat, high resolution screen that could be carried to the porch, the bus or train.

—Publishers could mass produce their content in the form of "read only memory", or ROM. These computer chips could store the equivalent of a book or magazine. They would be sold in retail stores or sent via the mail.

—Books as well as archival information could be stored on optical video discs, for viewing also on a television screen.

—It is possible—though still not feasible—to have an on-demand on-line video library. That is, the types of video audio and programs and films that are today distributed by cable or cassette, disks or broadcast, could be digitized and stored in a computer, much the way text is stored today. Just as we can call up text information on demand, so may the user at home request to see a particular movie or other program. Then, that viewer and that viewer only, can watch the movie, while other viewers are choosing their own shows. Thus, while today we think of 35 or 54 cable channels being filled simultaneously, in the future, a household might need only two or three cable channels, because they will not have to choose from among the offerings provided by some programmer, but view whatever they want to see, whenever they want to see it, from a library of computer-stored video program. Moreover, once digitized, individuals could create their own programs, by assembling pieces or scenes that producers could provide. For example, they might first select one of several opening scenes, then decide on a comic scene instead of a tragic scene, and so on. This sort of "create your own programming" is already being offered on some optical video discs.

—Computers may be programmed to do more than just be passive storage and transmission devices. They could receive the downloaded newspaper I described a few minutes ago and be programmed to select out those types of articles that the individual subscriber likes to see: for example, the score of the local baseball tean, any news about the airline industry, any want ads for used sailboats between 24 and 32 feet and costing less than $40,000. One day, we may have computers that can take a written work and create an abstract from it.

—Publishers of reference works, such as encyclopedias, are already providing on-line access to users with home computers. As telephone transmission speeds get faster, some customers could decide to have the entire work "downloaded" onto their own mass storage media. Then, after the one time charge for this transmission, they would not have to pay continuing royalties to either the owner of the reference material or the service bureau that provided the computer facility. They could also make electronic copies to sell or just give to friends.

IMPLICATIONS FOR COPYRIGHT

The concept of copyright was not practical in a society when human memory was the primary repository of records and creativity and not enforceable in the pre-Gutenberg world. The modern notion of copyright is largely a function of the technology of the printing press. It made possible centralized control of the production process for written works.

In the mid ~~18~~19th century, a confluence of factors, including the steam driven rotary press, made possible relatively cheap reproduction of print and lead to the democratization of the consumption of intellectual property. More modern media forms--film, phonograph records, radio and television broadcasting--shared with the printing press the mass production and distribution of many identical products, also relatively easily controlled by suppliers of the creative works. Thus, the print notion of copyright was readily transferable to these newer forms.

Today, we are looking at a substantial change in the nature of control. Starting with audio tapes and photocopying machines, we have seen a proliferation of inexpensive techniques for democratizing the production of intellectual property. Video tape machines, floppy disks and other forms of computer-readable storage devices are making it easier for users of content to create, store, reproduce and transmit intellectual property. But instead of simply making a faithful duplicate of the original, computer programs can tinker with original content, creating an output that is fundamentally different from the content entered into the computer, yet which was not specifically anticipated by the creator of the algorithms in the computer program.

These fundamental changes give rise to questions may have to be addressed in the reconsideration of the nature of copyright. Among them are:

—Who is the "author" of "original" material created by a computer program, such as an abstract from a longer article: the computer programmer? the author of the original article or book? the owner of the computer? the computer?

—How does one measure which source has added what elements to a creative work if the digital editing and duplication process leaves no visible trail, unlike penciled marginal notes?

—How, if at all, can duplication and transmission of electronic works by users in the home or office be measured?

—How can one tell the difference between a legally authorized copy and a "bootleg" copy, particularly when dealing with textual material that has come from the computer of the publisher to the computer of the user?

—What mechanisms can ascertain that creators of intellectual property get compensated for their contributions without stunting the development of technological tools that are expanding the process and format options available for these creators?

The challenge for public policymakers is to construct laws and regulations that are flexible enough to respond to very uncertain technological developments and unpredictable market changes. We can be relatively accurate in predicting what the technology already in existence or in the laboratories makes possible. But wrong or premature regulation may stifle otherwise useful developments. Waiting too long to correct an inequity may result in the politically expedient necessity of having to grandfather many exceptions.

Thank you for the opportunity to participate in this hearing.

Appendix A

May 1983

PROGRAM ON INFORMATION RESOURCES POLICY

Harvard University

Center for Information Policy Research

Contributors

- Abt Associates Inc.
- Action for Children's Television
- American Broadcasting Companies, Inc.
- American District Telegraph Co.
- American Telephone & Telegraph Co.
- Arthur D. Little, Inc.
- Auerbach Publishers Inc.
- Automated Marketing Systems
- Bell Telephone Company of Pennsylvania
- Berner & Berner
- The Boston Globe
- Booz-Allen Hamilton
- Canada Post
- CBS Inc.
- Channel Four Television Co. (Ltd.) (United Kingdom)
- Citibank N.A.
- Codex Corp.
- Communications Workers of America
- Computer & Communications Industry Assoc.
- COMSAT
- Continental Cablevision, Inc.
- Continental Telephone Corp.
- Copley Newspapers
- Cowles Media Co.
- Cox Enterprises, Inc.
- Department of Communications (Canada)
- Des Moines Register and Tribune Co.
- Dialog Information Services, Inc.
- Digital Equipment Corp.
- Direction Generale des Telecommunications (France)
- Diversified Communications, Inc.
- Doubleday, Inc.
- Dow Jones & Co., Inc.
- Drexel Burnham Lambert Inc.
- Dun & Bradstreet
- Economics and Technology, Inc.
- Federal Reserve Bank of Boston
- Field Enterprises, Inc.
- France Telecom (France)
- Frost & Sullivan, Inc.
- Gannett Co., Inc.
- Gartner Group, Inc.
- General Electric Co.
- General Telephone & Electronics
- Hallmark Cards, Inc.
- Hambrecht & Quist
- Harte-Hanks Communications, Inc.
- Hazel Associates
- Hitachi Research Institute (Japan)
- Honeywell, Inc.
- Hughes Communication Services, Inc.
- E.F. Hutton and Co., Inc.
- IBM Corp.
- Information Gatekeepers, Inc.
- International Data Corp.
- International Resource Development, Inc.
- Invoco AB Gunnar Bergvall (Sweden)
- Irving Trust Co.
- Knowledge Industry Publications, Inc.
- Kokusai Denshin Denwa Co., Ltd. (Japan)
- Lee Enterprises, Inc.
- MCI Telecommunications, Inc.
- McKinsey & Co., Inc.
- Mead Data Central
- MITRE Corp.
- Motorola, Inc.
- National Association of Letter Carriers
- NCR Corp.
- National Telephone Cooperative Assoc.
- New York Times Co.
- NEC Corp. (Japan)
- Nippon Telegraph & Telephone Public Corp. (Japan)
- Norfolk & Southern Corporation
- Northern Telecom Ltd. (Canada)
- Ohio Bell
- The Overseas Telecommunications Commission (Australia)
- Pearson Longman Ltd. (United Kingdom)
- Pitney Bowes, Inc.
- Public Agenda Foundation
- Reader's Digest Association, Inc.
- Research Institute of Telecommunications and Economics (Japan)
- St. Regis Paper Co.
- Salomon Brothers
- Satellite Business Systems
- Scaife Family Charitable Trusts
- Scott & Fetzer Co.
- Seiden & de Cuevas, Inc.
- Source Telecomputing Corp.
- Southern Pacific Communications Co.
- Telecommunications Research Action Center (TRAC)
- Time Inc.
- Times Mirror Co.
- Times Publishing Co.
- United Parcel Service
- United States Government:
  - Central Intelligence Agency
  - Department of Commerce:
    - National Technical Information Service
    - National Telecommunications and Information Administration
  - Department of Defense:
    - Office of the Under Secretary of Defense for Policy
  - Department of Energy
  - Federal Communications Commission
  - Internal Revenue Service
  - National Aeronautics and Space Admin.
  - National Communications System
  - National Security Agency
  - United States Postal Rate Commission
  - United States Postal Service
- U.S. - Japan Foundation
- United Telecommunications, Inc.
- Voice of America
- Warner Amex Cable Communications Inc.
- Warner Communications, Inc.
- The Washington Post Co.
- Western Union

FIGURE 1

THE "INFORMATION BUSINESS"
1780

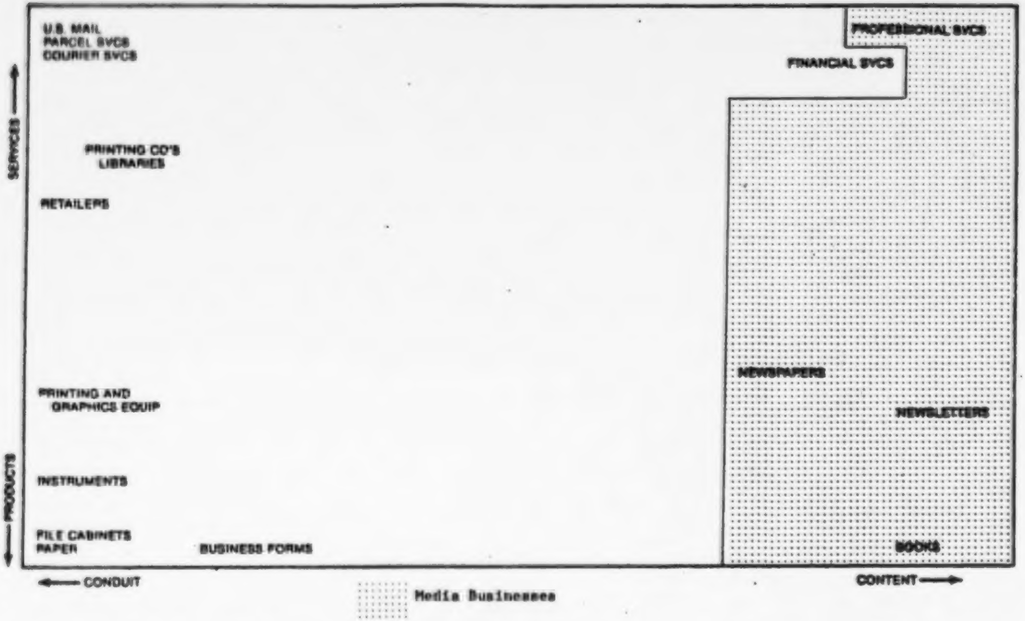
U.S. MAIL
PARCEL SVCS
COURIER SVCS
PROFESSIONAL SVCS
FINANCIAL SVCS
SERVICES
PRINTING CO'S
LIBRARIES
RETAILERS
NEWSPAPERS
PRINTING AND
GRAPHICS EQUIP
NEWSLETTERS
PRODUCTS
INSTRUMENTS
FILE CABINETS
PAPER
BUSINESS FORMS
BOOKS
CONDUIT
CONTENT
Media Businesses

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FIGURE 2

THE "INFORMATION BUSINESS"

1880

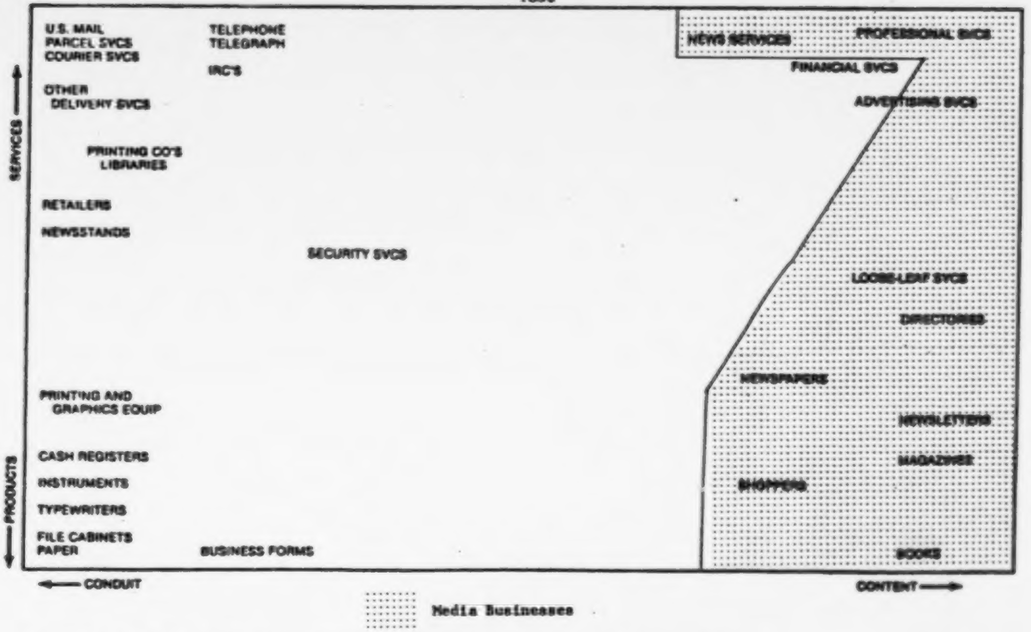
U.S. MAIL
PARCEL SVCS
COURIER SVCS
TELEPHONE
TELEGRAPH
IRC'S
OTHER
DELIVERY SVCS
PRINTING CO'S
LIBRARIES
RETAILERS
NEWSSTANDS
SECURITY SVCS
PRINTING AND
GRAPHICS EQUIP
CASH REGISTERS
INSTRUMENTS
TYPEWRITERS
FILE CABINETS
PAPER
BUSINESS FORMS
NEWS SERVICES
PROFESSIONAL SVCS
FINANCIAL SVCS
ADVERTISING SVCS
LOOSE-LEAF SVCS
DIRECTORIES
NEWSPAPERS
NEWSLETTERS
MAGAZINES
SHOPPERS
BOOKS
SERVICES
PRODUCTS
CONDUIT
CONTENT
Media Businesses

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FIGURE 3

THE "INFORMATION BUSINESS"

1983

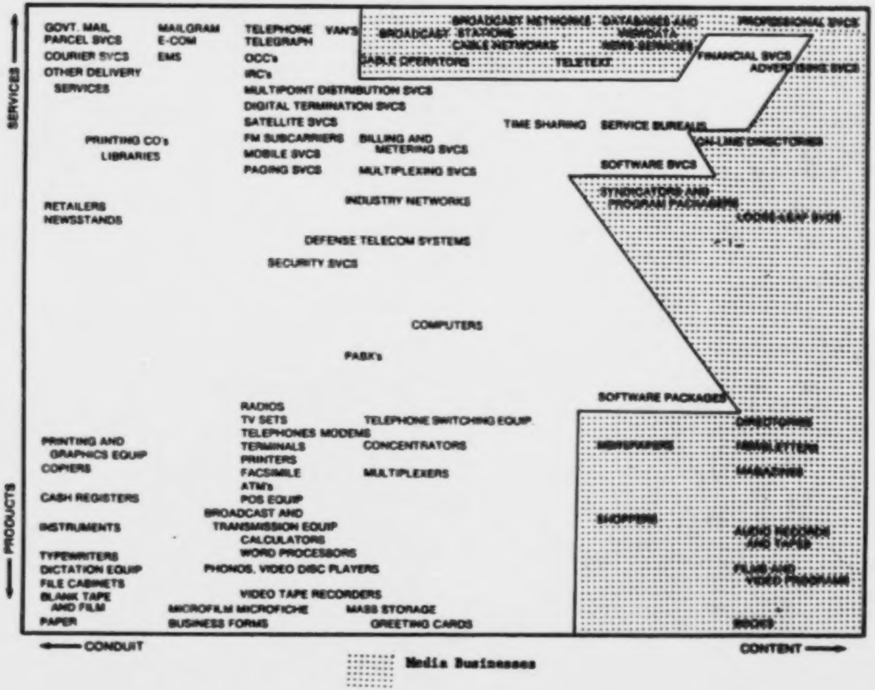
SERVICES
PRODUCTS
CONDUIT
CONTENT
GOVT. MAIL
PARCEL SVCS
COURIER SVCS
OTHER DELIVERY SERVICES
PRINTING CO's
LIBRARIES
RETAILERS
NEWSSTANDS
MAILGRAM
E-COM
EMS
TELEPHONE
TELEGRAPH
OCC's
IRC's
MULTIPOINT DISTRIBUTION SVCS
DIGITAL TERMINATION SVCS
SATELLITE SVCS
FM SUBCARRIERS
MOBILE SVCS
PAGING SVCS
VAN'S
BROADCAST NETWORKS
BROADCAST STATIONS
CABLE NETWORKS
CABLE OPERATORS
TELETEXT
DATABASES AND VIEWDATA
NEWS SERVICES
PROFESSIONAL SVCS
FINANCIAL SVCS
ADVERTISING SVCS
BILLING AND METERING SVCS
MULTIPLEXING SVCS
INDUSTRY NETWORKS
DEFENSE TELECOM SYSTEMS
SECURITY SVCS
TIME SHARING
SERVICE BUREAUS
ON-LINE DIRECTORIES
SOFTWARE SVCS
SYNDICATORS AND PROGRAM PACKAGERS
LOOSE-LEAF SVCS
COMPUTERS
PABX's
SOFTWARE PACKAGES
RADIOS
TV SETS
TELEPHONES MODEMS
TERMINALS
PRINTERS
FACSIMILE
ATM's
POS EQUIP
BROADCAST AND TRANSMISSION EQUIP
CALCULATORS
WORD PROCESSORS
PHONOS, VIDEO DISC PLAYERS
VIDEO TAPE RECORDERS
TELEPHONE SWITCHING EQUIP
CONCENTRATORS
MULTIPLEXERS
PRINTING AND GRAPHICS EQUIP
COPIERS
CASH REGISTERS
INSTRUMENTS
TYPEWRITERS
DICTATION EQUIP
FILE CABINETS
BLANK TAPE AND FILM
PAPER
MICROFILM MICROFICHE
BUSINESS FORMS
MASS STORAGE
GREETING CARDS
NEWSPAPERS
SHOPPERS
DIRECTORIES
NEWSLETTERS
MAGAZINES
AUDIO RECORDS AND TAPES
FILMS AND VIDEO PROGRAMS
BOOKS
Media Businesses

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FIGURE 4: TOWARD DESCRIBING THE NEW MEDIA ARENA

CONTENT

Examples of its Components
- Paragraphs
- Issues
- Words
- Stories
- etc.

Some descriptive Characteristics
- Breadth of audience (e.g., mass/special interest)
- Market segment (e.g., end user, demographics)
- Manner of financing
- etc.

Examples of types of Content
- News
- Entertainment
- Education
- Culture
- Persuasion
- Data
- etc.

PROCESS

Functions such as
- gathering
- creating
- storing } information
- handling
- transmitting
- etc.

Some descriptive Characteristics
- Rate of transmission
- Method of transmission
- Cost
- Extent of coverage
- Type of carrier (e.g. common, dedicated)
- Difficulty of use
- Direction of flow
- etc.

Examples of Processes
- Broadcasting
- Coaxial or other cable
- Mail
- Private carriers
- Microwave
- Computer
- Printing
- Disc or cassette
- etc.

FORMAT

Functions include
- Display content
- Implicit message conveyance

Some descriptive Characteristics
- Electronic or mechanical
- Degree of permanence
- Hardware needed for user
- Source of control over rate of content display
- Method of user accessibility (e.g., random entry, sequential)
- etc.

Examples of Formats
- Video on screen (VDT)
- Ink on paper
- Electronic or mechanical sound
- Optical/mechanical light projection
- etc.

Source: Program on Information Resources Policy, Harvard University

Mr. Kastenmeier. Thank you very much, Professor Compaine, for that presentation. It is very provocative and very useful.

I have several questions.

In terms of creativity, we quite often hear that lessening protection of intellectual property would be a disincentive for creativity—and that the converse also would be true, that is, more protection for intellectual property would be a greater incentive for creativity.

In light of what you have said, do you agree with that?

Mr. Compaine. I think the primary question is determining these days what is intellectual property. There is no doubt that the creators of intellectual property need to be compensated, and adequately compensated. If that is eroded, I feel confident that there would be far less incentive for people to create.

But the fundamental change is deciding what is the intellectual property. In the case of the computer algorithm, is the intellectual property something that a computer has created by putting in some information and then spitting out something that is readable or entertaining, or is the real intellectual property the computer program itself, the algorithm, that made the output possible?

Mr. Kastenmeier. Is it one or the other, or could it be neither?

Mr. Compaine. In the tradition of copyright, that is, protecting creativity—intellectual property—probably it is the computer algorithm we want to protect. That is what we want to provide reasonable compensation for, that's what is actually doing the creating. That is very different from what we are used to doing.

Mr. Kastenmeier. Other than traditional copyright protection, are there other incentives that could be used successfully to increase creativity and perhaps access? In other words, in some respects is copyright outmoded as the device to reward economically?

Mr. Compaine. Either outmoded or increasingly unenforceable, which makes it sort of moot. I am not a lawyer but one possibility might be increasing reliance on contracts that may provide greater upfront rewards to the first user of something. But I think very often there may have to be greater reliance on contracts between the creator and the purchaser, the original purchaser, such as a publisher who buys a computer program, or buys a method of doing something.

Mr. Kastenmeier. We have heard some predictions of what to expect from new technology and you have commented on this, but to restate the proposition, do you think society would be better served if the law responds to changes as they occur, or tries to anticipate them?

Do you think we ought to try to anticipate change in this area? If so, how might that be done?

Mr. Compaine. I think to try to anticipate the change is futile. It is a real swamp. We should have already learned our lesson. Ten years ago we couldn't anticipate what is happening today. And these grow off each other. One thing changes and that creates a number of other changes that we couldn't anticipate.

My feeling is that any legislation will probably have to be very flexible and very general. We will probably have to rely on the courts to act as a tripwire. When you start seeing a bunch of certain types of cases in the courts, that may then be an indication that it is time for legislation.

But it you try to anticipate what is going to happen, I think you will be back here every 3 or 4 years having these hearings and asking, "What do we do now?" Every 5 years you will be out of date.

Mr. Kastenmeier. Then your advice is to respond to these questions as they arise, but not wait too long?

Mr. Compaine. It is not easy—I am not trying to minimize the gravity of this. In general, I think, yes. You have to wait and respond to real problems, recognizing in the short term there may be some confusion and a few inequities. But I think that is probably the safer and in the long term, more socially beneficial way than trying to figure out what is going to happen in this area.

Mr. Kastenmeier. I think I have used up my time. I thank you and I yield to the gentleman from California, Mr. Moorhead.

Mr. Moorhead. Thank you.

Don't you have pretty much the same problems in determining computer materials that you have at the present time? If you have a book or a study that comes out that is copyrighted and you issue a book report or a synopsis of it, you really are subject to the copyright laws. You talk about using an abstract, a longer article on the computer, and copying that. Don't you basically have the same old problems? If it is just a review you probably are not in any trouble but if it is for all intents and purposes copying the original article in a summary form that you do have problems.

Mr. Compaine. The problem is if I write a review of something, or an abstract of something, presumably I could copyright it. But if you then publish the same review, word for word, someone would say you have violated my copyright. But if two publishers published the same word-for-word piece, because they both bought the same computer program which generated the review, how do you determine that one of those is protected and another is an unfair copy? They both used the same computer program.

It gets more complex. How do you copyright a data base, an electronic computer stored data base when that data base is perhaps being updated every minute, and it is constantly changing?

Mr. Moorhead. You talk in here about copying in the home. Now, you know there is legislation pending that would put an extra charge on the blank tape that is sold for a person's own use. If that bill is passed it would be legal to copy the materials that came in as long as you only used it for your own personal use and didn't sell it.

Mr. Compaine. I don't want to get involved in that specific piece.

Mr. Moorhead. We are involved with the specifics and not just the abstract.

Mr. Compaine. That's right. That's why you are sitting there and I am here.

I think that it gets much more difficult when we talk about the computer side of things because you start putting things in digitized forms and it is almost uncontrollable for you to prevent me from copying a floppy disc, especially with hackers around who can break any code and sell them.

You can say, OK, we will put a 25-cent fee on every floppy disc that gets sold. The idea then is that you cannot enforce who controls the actual information itself. We are moving the control of information from the centralized printers and distributors out to the millions of homes and offices, each of whom can manipulate and change that information with virtually no outside control on it.

Mr. **Moorhead.** But that is true to a great extent with books that are published. They are put out and people make abstracts of the book and they pull materials out of it but it is still floating around.

Mr. **Compaine.** Very true, but it is very hard to reprint that whole book. It is very expensive to literally reprint that book, especially in a form that makes it look just like the original book. If I want to reproduce a textbook and do it in four colors and do the same type style, it is very expensive, and it is much easier to trace if someone should try to reprint copies without permission.

If that same book is downloaded onto my floppy disc or computer main frame memory, I can duplicate that and transmit it around at virtually no cost.

Mr. **Moorhead.** I want to thank you for getting us thinking about some of these many problems that are ahead of us. Obviously, we are going to be dependent to some extent on how the courts come down on these things and we are going to have to set some of the policy ourselves here in the Congress. But we will certainly be very interested in some of the answers that you may have to our problems as we move forward, and the help that you can, perhaps, give us.

Thank you.

Mr. **Kastenmeier.** The gentleman from Kentucky.

Mr. **Mazzoli.** Thank you, Mr. Chairman.

Let me first commend the chairman of our subcommittee for calling this whole series of hearings. I think it could well yield some information and some ideas for the future for ourselves and I thank the gentleman for putting himself out.

Let me thank you, too, Doctor, for your statements. I was particularly struck by the way you said that it is really a swamp out there. I am beginning to think of some kind of a dank forest, if you take a wrong step you will get sucked up by quicksand.

It really is, I think, both a legalistic as well as a technological swamp out there and somehow we have to navigate that swamp, hopefully, without being swallowed up by the quicksand pits there.

Let me ask you, also, you said in answer to a question from our chairman that you didn't think that we could anticipate all of this because it is a real swamp out there and that we should respond but don't wait too long in responding and let the court be the tripwire.

Isn't that really just stating what the state of today is?

Mr. **Compaine.** I'm sorry, isn't——

Mr. **Mazzoli.** Isn't that in a sense saying where we are today and yet we are trying to have this series of hearings to let us get into tomorrow in perhaps a little different posture than we have faced the problems today?

Mr. **Compaine.** I guess what I am suggesting—I agree that these hearings are the right thing to do. As you go through this there are all sorts of interests out there, as you well know, and if you get too specific in what you come up with, such as a 50-cent tax on something called a video tape. Then what happens if, 15 or 20 years from now instead of video tape everything is digitized and stored in the computer and you don't have to have a physical piece to put in your recorder? It may be that the specificity of that legislation or regulation can be gotten around because of some superseding technology that comes faster than we thought or that we had anticipated.

So that whatever you come up with has to be couched in such general ways that it embodies principles rather than too many specifics.

Mr. **Mazzoli**. Actually, I thought that what we tried to do in setting up the Copyright Royalty Tribunal was to make it sort of general but the minute they put a specific dollar figure to the use of so many channels, immediately then everybody moves to wipe out their activity by saying that they went too far or didn't go far enough.

Whether we try to make it so specific as to cite every dollar-and-cent figure, or every percentage figure, or when we set up a general apparatus which would then react to specific situations, it seems we are still condemned and we still don't handle it right.

Mr. **Compaine**. That is why I said this is a swamp. And I don't think the problem is going to go away in this session or the next session of Congress. In fact, I think copyright and the whole notion of what is intellectual property and how does it get protected might be one of the major issues through the end of this century.

I really think it is complex enough that we are going to have to live with it for a long time. I wish I had something more optimistic for you but I don't see it that way.

Mr. **Mazzoli**. Thank you. I appreciate your candor. I guess that is really why I believe we are here today, to try to figure out if there is any way to anticipate the future. And I don't think we can anticipate it technologically because there are basement tinkerers and backyard inventors right now doing their number which is going to make obsolete everything which is now state of the art.

We never could, and probably never should, try to anticipate what they are going to move. But I guess with the hearings we are trying to figure out if there are certain guideposts or immutable truths that we could somehow incorporate into law which would then more or less guide us into the future without limiting these inventors in this kind of initiative. And at the same time, without putting the creative community totally to this posture of just being picked to death by a school of piranha fish where they would have nothing left of their own creative abilities, so I guess we are going to be faced with that.

Thank you very much, Doctor, for this opening presentation.

Thank you, Mr. Chairman.

Mr. **Kastenmeier**. The gentleman from Michigan, Mr. Sawyer.

Mr. **Sawyer**. Thank you, Mr. Chairman.

I think you correctly described it when you said it was kind of a swamp. Since I have been in Congress, I have never gotten involved in anything that was more complex and more defying of an intelligent solution that satisfied all of the questions. I finally settled down to kind of a simplistic view which suits me well and that is get rid of the whole machinery. And let the people with the problems go out and work out their own solutions.

You have the competing interests, as you are well aware, of the producers of the programs, the broadcasters, cable, satellites, not to mention professional sports and Ted Turner, and a few other lateral problems.

On difficult questions Congress tends to wait until some kind of a consensus or at least an appearance of a consensus just begins to become visible rather than to jump into the fray without letting it settle itself. But whenever we do that the courts step in then and decide the whole issue and then we complain that the courts are being too activist. I don't know what the answer is.

We are doing that right now with the Betamax problem, as you are probably aware. It really is a congressional problem. It is not a constitutional problem. It is a question of really making a law on what we are going to do with that. I guess they are getting a little befuddled by it, too.

It just seems to me if we follow the policy of waiting it out and letting the courts be the tripwire, they end up disposing of the whole thing and in effect legislate it.

Mr. Compaine. You can always come back and legislate. My point was that you let the courts make a few moves and that helps create greater consensus or contention and then Congress can decide when it wants to make the move to settle things. But you have to let the courts start that process.

I think you are also very right that much of this has to be settled by the contending forces out there, to come up with some agreements that they can all live with. And we see how difficult that has been up to now.

Mr. Sawyer. This Betamax, and I suppose audio recording is even more critical a problem since there are some 98 million audio recorders out there and there's only about a million, not quite a million, video recorders out there. So they have got very similar problems.

Of course, then you are trespassing in everybody's living room regarding what they have got the right to do and not the right to do.

I appreciate the chairman calling these hearings, because I need any help I can get in this area. Every time you think you have got something kind of worked out either there is a change in technology or something else that undoes it.

Again, I want to express my appreciation to the chairman, too. Thank you. I yield back.

Mr. Kastenmeier. The gentlewoman from Colorado.

Mrs. Schroeder. Thank you, Mr. Chairman.

I am sorry I missed the testimony. There are too many hearings going on at once.

I just wanted to make sure that I understood the thrust. The thrust was to hold off for a while because technology is changing so rapidly and maybe allow the people who are inventing this stuff to find ways to keep it from being copyrighted, and so forth?

Mr. Compaine. Generally, I would say it is such a rapidly changing area that the principle of copyright itself, based on printing technology and centralized production, may have to be rethought; that what computers can do to information—digitized information—changes the locus of control and the method of control.

Therefore, any legislation or regulation probably has to be fairly general and cannot accurately anticipate what is really going to happen.

Yes, in a nutshell, I would say anything you come up with today is probably going to be obsolete in 3 or 4 years. Anything that gets too specific and identifies specific technologies and tries to regulate the technologies as opposed to the principle of intellectual property is likely to come undone.

Mrs. **Schroeder.** I guess my only concern about that is how you continue then to regenerate the capital that you need to continue producing things in the area.

My main concern is in the area of textbooks, as you shift from textbooks to computer programs. One buys one and they all go home and copy a zillion copies.

How do you then get the money back to the group that is doing the original producing, in this or any other area? I think that is the big problem we have because competitively, internationally—we have to look at international competition—we somehow have to have the capital to be able to continue to produce the intellectual property that has kept us——

Mr. **Compaine.** I suspect that industry will probably find some ways. They might sell the first copy for some very high price and then allow the buyer, such as a school district, to reproduce the content. I think that probably the marketplace will provide some of the answers, although not necessarily all of them or all of the right ones, but you have got to give it a chance to work itself out.

Mrs. **Schroeder.** It is interesting. Thank you.

Mr. **Kastenmeier.** I would like to yield to the gentleman from Ohio who was the first one here today, I might add.

Mr. **DeWine.** The first one here but I think all of the questions have been asked. I appreciate the testimony and I have no questions, Mr. Chairman.

Mr. **Kastenmeier.** I will yield to you first next time.

I have a simplistic but fundamental question; that is, what is intellectual property? We talk about creativity, but is it really a euphemism or something that doesn't exist anymore in the sense that we protect the NFL football games as an intellectual creation where there is an author?

So, obviously, traditional concepts of the nature of the property we are protecting, even with reference to this identification with the individual creator, seem to be lost. I suspect that there is a question of what is intellectual property .

Second, let me just mention the fact that the semiconductor computer chip industry has been one of the most powerful industries in this country without patent or copyright protection for the chip and its design. It isn't that the industry couldn't use some sort of protection, but it doesn't have it. Nonetheless, it has gone forward as one of our most rapidly expanding industries.

Mr. **Compaine.** I think that is a very good point and that sort of gets me back to something that I said earlier, and that is there are other methods besides copyright that we can develop or will be developed to protect the intellectual property or the creativity, or whatever it is, whether it is contracts, trade secrets, some technology that really prevents copying of something on a disc or whatever.

So that I think we have to be creative in looking for solutions and not just presume that putting a royalty on everything is always the answer.

Mr. KASTENMEIER. On behalf of the committee, I thank you for opening this 2-day session on the future of copyright in this country. You have been very helpful to us, Professor Compaine, and we are indebted to you.

Mr. COMPAINE. Thank you, my pleasure.

Mr. KASTENMEIER. Our next witness is Joseph F. Coates, president of J. F. Coates, Inc., a policy research organization specializing in the future. Mr. Coates was formerly assistant to the director and head of exploratory research of the Congressional Office of Technology Assessment.

He is also president of two professional organizations with an eye on the future: The Association for Science and Technology and Innovation; and the International Association for Impact Assessment.

He is, himself, the holder of 19 patents and the author of more than 100 articles and papers.

Mr. Coates, we are very pleased to have you here this morning and we are looking forward to your testimony.

TESTIMONY OF JOSEPH F. COATES, PRESIDENT, J.F. COATES, INC.

Mr. COATES. Mr. Chairman, members of the subcommittee: It is a pleasure and an honor for me to be here to talk with you. I am a futurist. My associates and I earn our living by looking at long-range trends and developments in America and globally. And we try to shape that work in a way that is useful to public and private decisionmaking today. We see the study of the future as a highly productive doable enterprise that can help shape your judgments about actions.

What I would like to do is hit some of the high points, or what I take to be high points, in my prepared testimony and leave as much time as possible for questions.

Mr. KASTENMEIER. Without objection, your formal statement will be received and be made part of the record.

Mr. COATES. Before turning to the trends which I see influencing and shaping your deliberations, I would like to point out four principal conclusions that I come to. Then returning to the trends we will see how we got there.

First, I think it would be a serious mistake to do anything incremental with regard to copyright. It is essentially such an obsolescent category, concept and policy framework, that what is needed is radical restruction.

Second, I think it is abolutely critical to take copyright out of the courts. The courts are fundamentally an antisocial institution in this regard, at the moment, because the courts are committed to looking backward to operations and procedures of the past. We are talking about technological and scientific developments affecting intellectual property, knowledge, and information, which are fundamentally an expanding new cornucopia of social developments. Anything which permits these developments to be forced into the categories of the past is intrinsically, not accidentally a step backward.

Third, the committee, and people discussing this issue, definitely need some images of the future. What could we have; what do we want, 10, 20, 30 years from now? And with those images of the future in mind one can begin to shape general and specific legislation to deal with the future.

Finally, I think that there has to be some strong will, perhaps helped by an image of the future, to resist the screams that prevail among those who will inevitably be dislocated in this transition period. The screams come loud and clear and they often drown out the sense of what one may want for the future.

Let me turn now to some of the trends that lead to those conclusions.

First and most significant, the overarching conclusion is that America has moved into a so-called postindustrial society, a society characterized by basic dependency on knowledge and information; a society in which science and technology continually are moving to center stage as the fundamental instruments for producing knowledge. The centrality of the knowledge machine and knowledge in society is affecting every aspect of our world.

Very often this change is continuous but rapid; occasionally it is highly disruptive. An example is agriculture. The fact that 3 percent of the Nation produce our food is largely the result of application of new knowledge. It is not necessarily that the farmers are working harder. The knowledge machine shows them how to work better and more effectively.

The new and exciting industries outside computers and electronics, such as genetics, ceramics, materials, pharmaceuticals, and chemicals, are all driven by this knowledge machine. That is what is transforming our economy. It is altering the work force: 45 to 55 percent of workers, depending upon how you would make the count, are now in the business of generating, processing, storing, and handling information.

That is truly a radical transformation in the work force. New developments legislative with regard to information have to reflect this absolutely basic change in the structure of the economy.

As pointed out years ago by Prof. Daniel Bell at Harvard, as we move into this knowledge society, this postindustrial society, what is essential to the economy is shifting.

In a farm-based society of the Colonial era it was land. In the industrial society through the 1940's and 1950's it was the ownership of the means of production. Increasingly the central thing in our society is the ownership and control of the production of knowledge and information.

It is with that central concept as background that I think you should be deliberating.

One of the things that goes along with the information society is the rise of what I would call "the intellectual commons." Increasingly, Americans everywhere are expecting full, free and ready access to all kinds of information. You see it in congressional legislation, under the Environmental Policy Act in the environmental impact statements. You see it in the Freedom of Information Act. You also see it aided by technology, the video recorder, the audio recorder, the Xerox machine, all devices, for expanding the intellectual commons. Anything you do to constrain the intellectual commons is effectively thwarting a major movement into the future.

The second major overarching trend I want to focus on is a family of technological developments which are blurring many traditional distinctions. The distinction between what is printed and not printed is obscured now by computers, by floppy discs, by Xerox. Anyone with a keyboard and a few thousand dollars' worth of modern equipment can become an independent publisher. Thousands of people are now doing that.

The new technology thwarts the fundamental basis for copyright which was the development of large-scale printing where there were, so to speak, node points or bottlenecks—points at which one could exercise control. That intrinsic capability to exercise control has disappeared as the new production technology becomes distributed and available to anyone.

Any legislation framed around bottlenecks, control points, is likely to be wrong-headed.

Right here on Capitol Hill you can issue a thousand personalized letters to a thousand constituents. Right now, it is practical to go far beyond that in personalized books, plays, video, audio.

The sense of the new products are not the industrial model of identical, high quality, and uniform. The new products are tailor-made, diverse, fitted to the occasion, and shaped to the moment. And the law has to reflect that new protean capability that technology brings us.

The ability to define what is printed and not printed is becoming obscure because we can now increasingly easily, cheaply, economically, and practically go from voice to print, print to electronic, electronic to print, print to voice, voice to voice. All the relationships are now open, practical, and economic. The point here is that any new legislation based implicitly or explicitly on the print concept is running counter to the future.

Let me point out also, that there is a major gap that would be nice to have filled in terms of your deliberation. There is no economic theory of information. You could, between now and Sunday night, read every significant printed document on the economics of information. And one of the things the committee might very well be doing is pushing the Federal establishment and the academic community to probe that extremely important area. If you don't know what it costs, it is pretty hard to legislate.

Another point to keep in mind is the growing prominence in this postindustrial world of intellectual inventions. Intellectual inventions will be more important because they are the heart of the intellectual knowledge machine.

Intellectual inventions—let me illustrate two of them, to show that they are as much inventions as this wax-covered paper cup on the table in front of me. Beardsley Ruml, in 1940, invented pay-as-you-go income tax, a social invention that is at least as significant as wax paper cups. Yet, Ruml never got anything out of it except prestige and a pat on the back.

Let me give you a case of an intellectual invention which is an interesting mixed case in which, to the best of my knowledge, the inventors never received a nickel: the highway cloverleaf. The cloverleaf highway design has saved tens of thousands of lives, hundreds of millions of hours, and yet the inventor has not received any acknowledgement or recognition, much less a penny of return on it.

As these kinds of intellectual tools become more prominent in the future, we have to find ways of rewarding people, both financially and otherwise.

A trend in terms of illegal reproduction, is interesting because it tends to bring out the worst in our juridical system. There are some kinds of products which are ephemeral: tip sheets, newsletters, nonce reports of transient activities.

These, perhaps, need a new kind of highly effective, short-term protection which is then wiped out quickly.

The whole concern about reproduction of tapes, movies, and printed matter, is in some sense overblown.

Let me turn to the status of software. I think that is a critical and interesting question because software is rapidly expanding in importance as the physical technology, the hardware of the new world of information, telecommunications, and computers permeates society. This is the programing material, the electronic brain material that makes it all work.

I don't think there can be any question that ownership should be established over it since that is one condition for taxing it. But a second criterion for ownership is as a mechanism for building recognition and reward. There can't be any question that we need to protect software by some mechanism. But how it is done, I think is an open question.

If forced into the traditional copyright context, it would become a field day and a bonanza for the legal community to catch all parties in infinite litigation, court proceedings, and socially destructive rigamarole.

Software produces a capability. There are many variations on a particular software package for producing that capability. It seems to me the new challenge is how to safeguard the rights of someone who has demonstrated a capability that can be embodied in thousands of minor variations? How do you keep the predators from preying on that genius?

Other trends which I think are important are developments in technology which are creating unprecedented access and equity questions. By remote sensing we can create images, photographs of a variety of different sorts of terrain. That information can provide many people with access to knowledge of minerals or other assets. This in turn can lead to unfair exploitative development deals.

A new question is who has the rights to pictures and knowledge and information about your property? The new intellectual tools are creating new kinds of questions.

The residence and the location of information are creating questions of rights of access and ownership over intellectual property. Increasingly large amounts of the globe's knowledge are stockpiled in the United States. Canadian businessmen, I think, are acutely aware that this is a potential problem.

As I understand it, the street maps of Zurich, for example, are also stored in computers in the United States.

So the question of the international flow of data becomes a new question in terms of rights and access.

The turbulence about these questions is nicely brought out in the dispute about such things as the rights to reproduce video and the rights to reproduce print. I think the industry is taking a grubby, traditional short-term economic selfinterest position—take the money today and forget about the future.

If one has a view that says American society is increasingly going to be permeated by this new information technology, if one recognizes that technology is central to the economy and intrinsically democratizing in its political implications, one should frame legislation which promotes the freest and most open exchange of information and let the short-term issues be treated as short-term transition questions.

This notion of taxing the tape or taxing the machine is just the most narrow kind of short-term self-interest inhibiting the greater public good.

You have the same thing in the scientific community in which the scientific publishers have already proliferated an absolutely asinine system of rights and access and payback. To the best of my knowledge it has not constrained anybody from reproducing an article and probably has a general effect of degrading respect for the law.

Technology is also affecting language. Hardware, software, micro, modem, bytes, bits, mouse, light pen—these and other terms are coming into the language at a great rate. But more important than vocabulary, the structure of the language, the grammar, is changing. Such things as graphics are creating new modes of knowledge, new ways of looking at things. It is rather clear that this new technology will shape the very way we think. We must be sure that in protecting interests that we stimulate new thinking, not thwart it.

Science is creating interesting new basic questions of legal categorization. The fundamental principle of genetic science, molecular biology, is that the genes which code the structure of every living organism are an information code. If you are concerned with information, the interesting question of the following sort comes up: Let's say we create in the laboratory a new organism that has commercially desirable characteristics.

One way to look at it is that the organism is merely a specific embodiment of a code in the same way that a published book is a specific embodiment of an author's manuscript. Maybe it should be protected under something like copyright. On the other hand, the way the law is now going it is embodied as a composition of matter and protected under patents.

To try to force that discussion in either of those categories is not productive. What one has to do is have an image of the future of society and frame the legislation to optimize on what we want the future to be like.

One of the implications of this point is that legislation which has an old law and a new law element to it might be very important in the future. Certain things could be protected by the past law and new developments protected under new legislation.

Technologically, there are interesting things coming along that may modify some of our preconceptions rather sharply. Encryption technology, for example, the ability to encode very complex material at relatively low cost, and provide keys to vast numbers of users may in fact modify the sense of privacy, security, economic, and commercial access to much that is now available by telecommunications and computers. But that is such a new opportunity that its implications for your deliberations are wide open and vague.

Let me mention as one last area of trends, the integration of the global economy. Right now airplanes fly daily out of New York carrying office work, white collar work to the island of Jamaica, where you can hire a secretary fully literate in English and fully competent in office work for $3.50 an hour, compared to $6.50 in New York.

The export of information work by airplane is only a faint image of what will happen when we are exporting and importing it wholesale by telecommunications, satellite, and computers.

So the universe of discussion has broadened to the globe, not merely to the United States, and not merely to a particular industry.

The famous Chinese copies in Hong Kong are no longer limited to printed material. They are duplicating in Hong Kong, Taiwan, Singapore, and a dozen other places the physical technologies of this new era of information. Integrating that trend into our thinking is important for the future.

Finally, let me suggest that the integration of the global economy suggests that it is not unreasonable to conclude that by the turn of the century, the software capital of the world may very well be India, with its vast stock of underutilized doctoral level scientists and engineers. Integration of the global economy, it seems to me, should be important to the future.

Let me end by suggesting a single, somewhat pallid image of the future which, if developed further, might be useful in your deliberations.

As I see it, by the turn of the century the average American household will have as large an investment in computers, telecommunications, and related matters as it now has in the automobile.

The best estimates today are that investment runs $1,500. We are talking about it running up to about the area of $5,000, $6,000, $7,000, or $10,000. That is a fundamental, technical, economic, social democratic transformation. It is that image which should inform your deliberations.

Thank you very much for this opportunity to talk with you.

[The statement of Mr. Coates follows:]

JFCOATES INC.
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2:00 P.M., July 20, 1983
Room 2226
Rayburn House Office Building

TESTIMONY OF JOSEPH F. COATES
At The Hearings On
TECHNOLOGICAL CHANGE AND ITS IMPACTS ON COPYRIGHT
Before
The House Judiciary Subcommittee on Courts, Civil
Liberties, and the Administration of Justice

It is an honor to have the opportunity to speak to you about major changes in technology and in American society apropos of the exercise of your oversight function on copyright. I am a futurist, that is, one who earns his living in the systematic study for public and private clients, of long-range trends in American and the global society and their implications for present day decisions. I believe that I can be most useful to the Committee in tracing out some of the major changes that should form a context for radically reconstructed legislation with regard to ownership and access to information, knowledge, and other intellectual property.

Before turning to the trends which are shaping the future, let me suggest several conclusions with regard to legislative needs. That should make clearer what the evidence I present is leading to.

> First, it would be a serious mistake to improve the present body of copyright law incrementally. To force the future into a mold of the past and the present would do a disservice to the nation.
>
> Second, actions should occur with some dispatch to stem the flow of court decisions which must force the future into historical arguments, categories, and decisions which are obsolete. The courts have the potential for crippling the future. They are increasingly exercising that potential.
>
> Third, we must anticipate and develop images of the future which focus from the point of view of this committee's deliberation on the role of knowledge and information in shaping society. In that way, new legislation can create a future which will permit the flourishing of information as a commodity and management instrument in

Let me just cite two intellectual inventions. One was pay-as-you-go income tax, invented by Beardsley Ruml in World War II. Obviously, that is a major social invention having a profound value for society in terms of controlling inflation and being able to finance government expenditures. Ruml in no way benefitted from that, other than in satisfaction and prestige.

An interesting mixed case of an intellectual invention with a physical aspect is the highway cloverleaf. The cloverleaf is a major element in modern highway construction throughout the world, and yet to the best of my knowledge, the inventor of the cloverleaf never received any compensation and had no rights to that concept. It would seem perfectly reasonable that every cloverleaf built in the world as a device to speed transportation and save lives merits him a reward especially since we routinely reward people who invent such trivial or merely convenient things as styrofoam coffee cups and hula hoops. A major new need of the future will be to expand, elaborate, and perfect the concept of intellectual property and widen the variety of mechanisms for providing rewards.

Another derivitive consequence of the rapid pace of change in the information society is illustrated by the current concern over the illegal reproduction of video tapes and movies. Many things in our society, particularly but not exclusively in the area of entertainment and business (tip sheets and newsletters), have very high short-term economic value which rapidly decays. We may, therefore, need mechanisms which provide strong protection and severe sanctions for illegal use in the short run but become more relaxed and even are eliminated in the slightly longer run. Protecting information ephemera will be a growing problem.

Technology is also making possible infinite variations in written, printed, and graphic materials. In the same way that you on Capitol Hill can take a dictated letter and personalize it for every constituent, similar things can be done with books, voice and video tapes, graphics, maps, and so on. This creates problems and opportunities for protection.

An illustration of the problem of the new information society is the status of software. Traditionally, software was considered incidental to the development of hardware. As the price of hardware has fallen, and as the use of computers, both mainframe and micro permeates society, it is clear that the life-blood of that system is software, that is, programming. And there is no doubt in my mind that ownership rights should be attached to software, which incidentally is the basis for tax and revenue. But the role of software in various systems differs, and what the rules for protection should be is quite blurred. The need to clarify those points is enormous. The possibilities of minor variations on copyrighted software type are great. One must look out for the potential predatory practices in which minor variations effectively neutralize or infringe the rights of the developer.

Many of these questions would be best solved by mechanisms that take them out of the formalized court procedures and encourage other kinds of mechanisms such as mediation and arbitration. But again those laws should have built-in safeguards against proceduralization, which is increasingly the bane of our world. So long as the vast legions of lawyers have a stake in complexity, they will work diligently to complexify these matters to feather their own nest, while the longer term interests of society and individuals are thwarted. Forcing the new information technology into old copyright is a bonanza for lawyers and a blow to progress.

Trends in technology are creating new kinds of information and new kinds of potential copyright, ownership, and access issues. Take, for example, the case of space flights which remotely collect geographic information. These overflights now raise the issues as to who should have the right to deal with that information. It is truly a new perspective on the world; whether any precedent fits is an interesting question. Should someone have the right to information about your property if that right gives them a marginal advantage in knowing something about your property, such as the likelihood of a mineral or oil deposit, which, in turn, may let them effectively cheat you on a purchase of land or mineral rights? This issue is not only a domestic but increasingly an international affair.

Technology is also creating problems about the residence or the location of information. Vast amounts of Canadian business data are now stored in the Unites States, for example. The residence of data creates conflicts of ownership rights and access in terms of conflicting laws in different countries.

Theft, undesirable practices, and new uses of information are all creating turbulence. I would like to cite a few, to suggest the severity of the consequences of attempting to solve them in terms of already established categories. As we well know, people who own home videos often wish to copy a commercially available tape for their own showing. On the other hand, others are copying these things for re-selling, which is piracy or counterfeiting. The industry is concerned about this, but rather than looking for innovative long-term solutions, they are off on a traditional response based on precedent to constrain the right to reproduce this material. One industry suggests building a tax into the cost of video equipment to prepay for the losses from theft, thus raising the price of the equipment. This is clearly an anti-social move because the effect would be to discourage the general use of the new equipment, whereas common sense, business sense, and social interest say, keep the price at a level that will expand use of the new equipment.

Similarly, the print industry, particularly scientific publishers, have been concerned about preventing reproduced copies of their material from circulating. And again we created a foolishly elaborate system for protecting our rights, rather than finding innovative ways of effectively dealing with the issue. There is very little evidence to suggest that their solution has done anything but create an institutional annoyance and has not stopped the copying of scientific journal information. Again, short-term interests have blinded publishers to long-term alternatives and have led to a stultifying rather than an expansive solution. Bad law lends to its own neglect and to the ultimate disrespect for all law.

Technology is also affecting our language. "Hardware," "software," "micro," "modem," "byte," "bit," "mouse," and "light pen" are becoming common expressions. But the technology has more severe effects on the very style in which we structure information. The technology will inevitably modify our grammar as well as our vocabulary. We are also beginning to think in new linguistic styles as graphics, charts, figures, and tables become more commonplace. And finally, the printed word as seen through the computers and word processors is much more flexible and interactive. I do not know what the consequences of this are for copyright, but the changing nature of language certainly should be considered in your deliberation.

Science is creating some truly new questions in terms of the legal categorization of things increasingly important to the economy such as genetically produced products. By virtue of being living organisms they are the embodiment of genetic information, one could consider a genetically modified organism to be the analog of a book, i.e., a specific embodiment of a message. It could also be considered a composition of matter. In one case it would be a candidate for copyright; in the other, for patent protection. The one crucial question is what will best serve society over the next several decades.

As a final note of technological change, let me point out that the rapidly evolving technology of encryption may have a radical effect on issues of copyright and protection, since encryption may offer for the first time the practical equivalent of trade secrets accompanying the broad and wide dissemination of knowledge and information in the marketplace. Broadly disseminated information could be understandable only to those who have the key.

whether that is good or bad, and whether that should be encouraged or discouraged, is so new as to be a totally open question.

Finally, in the area of trends, let me note the integration of the global economy is leading even to the export of white collar work. Daily flights from New York City to the island of Jamaica carry white collar work back and forth. The well known Chinese copies by Taiwan and Hong Kong of printed matter have already expanded to Chinese copies of information technology and devices. Integration of the global economy has encouraged worldwide theft of films and video. And the integration of the global economy makes it quite plausible that by the end of the century the software capital of the world could very well become India with its vast repository of under-utilized scientists and engineers trained to the doctoral level. A global perspective must be integrated into the future deliberations about copyright and the role of ownership and access on our post-industrial globe.

Let me suggest an image of the future which would inform your deliberations. In my judgement, by the turn of the century, the average American household will have in use and at its disposal telematics equipment, that is, telecommunications and computer equipment and collateral support equipment, equal in value to the average family car. As this technology permeates society, legislation on copyright, that is, legislation framing the rights to ownership and access and use, should take into account the need to promote and stimulate this intrinsically democratizing, fundamentally revolutionary, and central economic and social wave sweeping over American society.

Thank you for this opportunity to talk with you today. I would be pleased to respond to any questions or comments.

> society, which, in turn, will stimulate socially, democratically, and economically desirable outcomes.
>
> Finally, many of the dislocations which inevitably must occur in a period of rapid social, economic, and technological transition should be examined from the deeper perspective of desirable social futures, so as to mitigate the temptation to respond to the brief but pressing travail of the moment by sacrificing more socially desirable outcomes right around the corner.

Let me turn now to some major trends in American society, as clues to the implications for information, intellectual property, and questions of the rights of ownership and access.

The central and overarching trend is the continuing movement of the United States into the so-called post-industrial society. The characteristics of the post-industrial society are information industries and the crucial value of new knowledge in the creation of new business and industry out of the great knowledge machine, science and technology. Complementing this rise of information and knowledge-related industries is a relative decline in the importance of manufacturing, processing, and handling of physical goods.

But there are few sharp breaks with the past. For example, the enormous productivity of agriculture is due in large part to the application of scientific and technological knowledge throughout food production, handling, and processing. Other successful new industries: telecommunications, electronics, microprocessing, genetics, chemistry, and materials, depend on new knowledge out of science and its application as technology.

The centrality of knowledge and information is also radically altering the pattern of the workforce. Depending upon the details of the count, 45-55% of the workforce is now in the information game. Only some 3% are in agriculture, and perhaps another 22% are engaged in the direct manufacture of products; the rest are in other forms of service.

The so-called post-industrial society, therefore, implies a fundamental shift in the concept of what is important in terms of ownership. In the pre-industrial era it was land. In the industrial era it was the instruments of production -- physical goods and property. The flourishing of copyright and the patent system, its analog, resulted from issues framed around physical ownership. The copyright of books became important only when books could be easily printed and reproduced. In a very direct way, copyright is a child of the printing press. As the printing press and its analogs decline in importance, so must traditional copyright. Copyright applies to movies because, like books, movies can only be made or reproduced in a few places, permitting ready control and monitoring, but it does not apply to an individual performance on stage or in a concert hall.

With the shift of knowledge and information to center stage, economically, socially, and now politically, we must begin to rethink legislation,rules, customs, and regulations dealing with the concepts of property, ownership, and access.

The post-industrial or information-based society has led to the rise of "the intellectual commons." The mass flow of information to and fro in society creates a new intellectual commons in which ideas are generated, rapidly fall into common currency, and their origins or source are lost sight of. Increasingly, all Americans expect full, ready, free, and equal access to information. From a social point of view, that access is central to the preservation and strength of democratic institutions. As the Founding Fathers pointed out, democracy depends upon an informed electorate.

We must, therefore, stimulate and expand the intellectual commons as a safeguard and stimulant of democracy. Many trends move in this direction: the Freedom of Information Act, the National Environmental Policy Act, the openess of congressional hearings, are all part of the expanding intellectual commons. The technology of the Xerox machine and its imitators and descendants is a physical tool for stimulating the intellectual commons, as is the home video recorder. In part, the new issue becomes protecting legitimate rights to intellectual property in the face of the higher social legitimacy of that intellectual commons. This is an ascending issue because never before has power been so unequivocally based on knowledge.

A second trend of major importance is that technological devices are blurring many traditional distinctions that form the basis for our thinking about knowledge and information. Distinctions between what is printed and not printed are rapidly blurring as Xerox or floppy discs and computers permit us to make a typewriter or keyboard into a miniature printing plant. As you are very familiar with here on Capitol Hill, a dictated letter can go through a word processor and become a thousand personal letters to a thousand constituents. Technology makes it possible to go directly from voice to electronics, from voice to voice, or from voice to electronics to print, or voice to electronics to print and voice. Soon it will be economically practical as it is now technologically feasible to go from voice to print. We have the capabilities of storage, not only in the traditional archival form, but electronically. Consequently, as technology blurs these distinctions, we must begin to think about what we want to do to positively manage these new technologies from a social point of view. Any legislative concept based merely on a printed or directly intelligible symbol is unsound.

It is worth noting that we are virtually bereft of any theory of the economics of information, and hence of any theory that would, from an economic point, guide fundamental legislation on the cost and value of various mechanisms for preserving the rights of ownership of and access to information.

Collateral to the rise of the information society is the rise to prominence of intellectual inventions. While we are all well familiar with physical inventions, everything from spacecrafts to the styrofoam coffee cups, we tend not to think of the development of institutional, organizational, and conceptual means of solving problems as inventions. But they are inventions, and they are becoming important.

Mr. **Kastenmeier**. Thank you, Mr. Coates, for that presentation.

Going back to your outline at the beginning, you indicated that we ought not improve the body of copyright law incrementally; rather, it deserves radical reconstruction, to use your words.

More specifically, how might we radically reconstruct the copyright law?

Mr. **Coates**. Let's just do it conceptually.

First, I think you ought to consider broadening the category of what is intellectual property, and what are the rights to intellectual property. The cloverleaf inventor; he merits your attention not because he invented the cloverleaf 40 years ago but because those kinds of inventions will be increasingly important.

The focus of your deliberations, it seems to me, should be intellectual property and the creation of knowledge.

Mr. **Kastenmeier**. Would you exclude some things which are currently protected?

Mr. **Coates**. My second point: We need a vast wipeout of things that are protected. The ephemeral, short-term, high value materials are now protected in the same way that durable things are protected. They ought to be removed from full protection.

So if you produce a tip sheet, fine. A tip sheet may have a lifetime of 3 weeks and then should be public domain. And going along with that ought to be very clear, severe, and unequivocal enforcement and punitive measures during the protected period. Protect where protection is needed, wipe it out when it is no longer needed.

Recognize that we are in transition and people will be hurt in transition. But others and society as a whole will benefit far more. That should be an informing principle.

So let the chips fall where they may in many of these electronic transition questions. For example, let's not worry about textbook writers and publishers. In fact, in my judgment, anyone who worries about the economics of textbook writers might very well be worrying about the high cost of taxi fares for the Rockefellers. They have got such a bonanza there that it is time they owned up to some transition.

The third element, I think has to do with this development of the intellectual commons. Any legislation ought to be framed around maximizing access, not constraining it and minimizing it. Where there is an economic stake in minimizing access, there are good established techniques available in the general economy.

For example, Business Week magazine does something which in my judgment is highly effective and also, incidentally, dumb. It prints its graphs and diagrams in a form that cannot be readily reproduced on a Xerox machine. So what do they do? They annoy people like me and they deprive lots of people of the ability to reproduce their stuff and use it in the short term.

Well, that is a perfectly reasonable plan they have worked out. It is fine in the marketplace. I don't think that they need additional protection.

The encryption I have mentioned may provide additional protection. It seems to me the sensible legislation ought to be pull the stopper on the bottle and have information flowing in every direction.

Mr. **Kastenmeier**. Apparently you assume and I certainly would not quarrel with you, that public domain is a valid concept, and one probably ought not be overprotecting things.

We were guilty of overkill in the 1976 copyright law where we extended copyright protection for 28 years, renewable for 28 more years, to 50 years plus life, or 75 years. The 28-year cutoff allowed a lot of material to flow into the public domain for which there was, as you say, just ephemeral use.

For example, there is very little value in protecting daily newspapers because any use made of them a few weeks would be fair use anyway, excerpting an editorial or whatever.

Yet, presumably, we protect those for 75 years, whether or not such overkill protection is needed. In that sense, I suppose what we did is really an anachronism. And to the extent that such protection might involve transactional costs within society, having to account for the fact that something is still protected which doesn't really serve the general interest and doesn't actually serve the proprietor's interest either.

Would you agree?

Mr. **Coates**. That's right.

Mr. **Kastenmeier**. I have several other questions but I would like to move on so I am going to yield to my colleagues. The gentleman from California, Mr. Moorhead.

Mr. **Moorhead**. Thank you. We appreciate your coming this morning. All of these discussions, of course, stimulate thinking, certainly.

One of the things that bothers me about the entire procedures that we have to go through in Congress in determining who is going to make these decisions, whether it is going to be the court or the Congress, probably stems from the fact that these things are moving so rapidly, and they have been for some time and they are going to continue to move so rapidly that we tend to stay out of it. We don't get decisions made on a year-to-year basis, even. And the problem gets more severe rather than being helped. Probably we should be working, and if we have to change the law 4 years down the line, then we change the law 4 years down the line to meet the new conditions.

But the way things go, we are almost totally dependent upon the court for their decisions which have to be made now and not when someone gets ready to move.

I think we come to the same thing on this copyright issue that you are discussing. There are people out there working and giving their lives in making moving pictures and making records of all kinds and description, and writing books. There is virtually nothing that gets on these computers that can't be copied. The day they get on them, they can be copied. And we have to find some way we can see that the people that produce various things, that put their lives into them, get reimbursed for what they have contributed to the rest of society.

If we just say that is public domain, there is no real incentive for the thinkers, and the producers, and the people that have artistic capabilities to put their product out because it won't be theirs any longer.

Mr. **Coates**. I think you are basically correct in many regards. But in other regards I think you have overstated the case. For example, take the production of a movie. If a producer invests $40 million in making a movie, he is going to recover the bulk of his money in 2 years or it is most likely a loss, a zero, a writeoff.

Now, that is not to say there aren't old standbys that are around forever. But basically, his problems are relatively short term and call for short-term protection. In the longer term, the economics and the structure of the industry change and the question of quality of the follow-on products is probably going to drive a lot of the counterfeiters out of the situation.

The simple fact is counterfeiting is a shlock operation which generally comes through with inferior quality and inferior performance. The market mechanism could very well work here.

But the point I made earlier was that we have very little by way of knowledge of the economics of information. Developing that area, perhaps holding hearings on it, but promoting its development as a branch of economics would be extremely valuable to your deliberations.

I can't judge whether you must act. But it seems to me that one of the things that you could act on and one of the characteristics of much legislation, is the framing of the sense of the Congress. If the sense of the Congress is that we are moving into, a knowledge-based era; that we are moving into the intellectual commons; that you want to expand rather than contract availability of information; that you want to open rather than control; that you want to make available rather than restrict, could become informing advice to the courts.

No matter what you do in the short run, there are opportunities to express a sense of the future in the legislation.

Mr. **Moorhead**. There is one area that really doesn't deal with our legislation here that concerns me more than anything else and that is when you put everything into these computers—every person in this room probably has all kinds of data in a computer base of one kind or another and in many instances it is colored by what items they included. I guess everyone has a lot of big pluses and they have some minuses. If the computer base has mostly minuses, the individual looks bad. And if it has mostly pluses, he could have a lot of minuses out here. It is colored and people can be very definitely affected by the way they are described in these things—their credit ratings, their job opportunities, many other things are very definitely affected by that thing.

Yet, I guess we saw that picture "War Games" that was out not long ago which I am sure is, to a great extent, fantasy, but you can break into these computer systems. Not many of them are totally secret, so they are tapped from time to time. There are a lot of American people that are being hurt by that kind of an approach. And yet there is no real capable way of protecting them.

Mr. **Coates**. It seems to me that, again, you have some historical clues as to the way that kind of a question can be dealt with. It is rather obvious that most people would not be candidates for any commercial credit if every flaw in their economic history became a block to giving them credit.

What tends to happen, in fact, in information systems, is that standards develop as to what is a significant or insignificant level of information about a person. So, for example, suppose you have got three slow pays in your record, or suppose you have got one deadbeat note in your record. That is measured against the experience of a large population and practical judgments are made. So that much of the concern about the misuse of information is overblown and miscast.

In terms of principles in forming your legislation, it is crucial to recognise that all forms of information are increasingly and totally interchangeable. That principle could form a background for any subsequent modification of copyright.

Mr. MOORHEAD. I guess what my point is, of course, information is wonderful and we are all surrounded by all kinds of information. But many times judgments have to be formed on incomplete information; in fact, everyone's judgments are based on incomplete decisions. It is unfortunate that many people's lives are affected so adversely by incomplete information or judgments of others in connection with them.

Even in your standards, those judgment factors outside of any kind of control other than by the people who place themselves in that position, are very, very influential in everybody's lives. I think it is something that is of concern.

We talk about knowledge as we have through this discussion, but knowledge is just an accumulation of experience that we have all had here on Earth. And that, too, can be colored by whose experience, and whose knowledge it is, and how complete it is, and what we get a hold of. All of this, I guess, becomes a rather esoteric kind of discussion.

But it is an important thing when privacy is involved and that is something that I am concerned with about individuals and also the protection of rights of the producers of any kind of work that is of value.

Mr. KASTENMEIER. If the gentleman will yield, this subcommittee is concerned with questions of privacy and civil liberties as well as first amendment freedom of publication, so we have an interface of several issues, in addition to intellectual property and copyright.

Mr. COATES. A comment on this point, errors in the system have far greater consequence when there are few systems and few channels. So there may be a critical credit office or a critical Federal agency, which can do you relatively significant damage. But in the image of the future I have tried to suggest, there will be so many information channels that the serious risks of a damaging response from a single source of knowledge about a person will be less. There will be many channels of information, richer and fuller with information and therefore self-corrective.

As the cost of information declines and the availability increases, those kinds of risks will be muted, not intensified, in my judgment.

Mr. KASTENMEIER. The gentleman from Kentucky.

Mr. MAZZOLI. Thank you very much, Mr. Chairman.

Thank you, Mr. Coates. It has been extremely interesting and I found myself suffering what might be called sensory overload. You really threw many ideas at us in a hurry and each one of them challenges us to rethink the whole proposition. I want to thank you for giving us this.

Let me move on a couple of points. Your three or four points were that we should not move incrementally but should take a much more radical or comprehensive view of the subject; that we should take copyright from the courts because they tend to face the past rather than look to the future. You suggested that this committee and all committees need images of the future so that we might understand the field we have to cope with.

I think your fourth point, which is a very big one to us, is to ignore the screams of those who would be dislocated or discommoded by these moves.

That fourth point, of course, is a big political problem to all of us because when the screams arise from certain quarters it is hard not to try both in humanity as well as in practical reality, to deal with them.

Let me ask about a couple of things. Your images of the future were well done, including the one that you gave us last about airplanes leaving New York bound for Kingston, and work to be done that is turned around and sent back to New York. That, I guess, could as well be done eventually by some data link, is that correct, and——

Mr. Coates. That's right.

Mr. Mazzoli [continuing]. Not even have the airplane trip at all.

Could it be that with this Ph. D. level talent in India one could also allow something to be done over there which could be shot back here by some data link?

Mr. Coates. There can't be any question about that; yes. Increasingly what is happening is, information is available everywhere, at declining costs. The technology for the dispersal of this is at the ground level microwave and fiberoptics technology in the local area; satellite and microwave for longer range transmission. And whether the unit over which you transmit is New York to California, Maine to Ohio, or Florida to India, is just a technical detail.

Mr. Mazzoli. The interesting part to me is, we are very well aware that the creative community—and I think the gentlelady from Colorado brought this up earlier—needs some reason to create, and they have to have incentive to create. If you cut off the incentive, you may have cut off their creativity which, of course, hurts us in the world.

Let me try to turn that around just a little bit. Is there any way to quantify or make relative the harm to the intellectual community in having their work rapidly assimilated by the general population and used without, in each case, some method of repayment?

In effect, the harm to them may not equal the gain to the population as a whole, the gain to the Government, the gain to the world, by having this information used.

I think you talked about the so-called information commons in which this material becomes, whether the creator likes it or not, part of the information upon which the world needs to move forward.

I wonder if you could help me just for a few minutes on that area. Is there anything which tends to quantify that or is it impossible to quantify that? Because if the harm doesn't equal the gain, maybe we have to change copyright entirely and say that they create either because they get it up front, or they create because they have some altruistic end in mind.

Mr. COATES. I don't think anyone can answer that question for you. We have looked at the question and there isn't any definitive information on it. What makes Johnny run? What makes the productive scientist and engineer produce? Well, obviously, money is one, but only one, aspect of that.

Much of what the controversy hinges around is not the physical side, the relatively patent-protectable side of the technology, but it hinges around the software, the programing for the electronic devices.

It seems to me there are several strategies that are worth exploring. First, do you tie people's names to things? In other words, how do you create heroes? How do you develop credit for the work which is done?

There are very few opportunities now in business and commerce for creating heroes. It is a strategy well worth exploring.

Second, one level closer to the copyright concept, is what is it you want to protect? The tendency is to want to protect the physical embodiment. This goes back to the industrial model. The protection should rather move from the physical embodiment to the capability.

If someone generates a capability to do something, that is perhaps the unit which should be protected in the future. And that capability, then, will permit variations within a framework—minor improvements, process improvements, incremental improvements—but still provide a core protection.

It seems to me that a concept that is worth exploring is: Can you protect the capability?

Mr. MAZZOLI. Let me ask you this, and this will be my last area. Well, it looks like we really have some problems.

Very quickly, if we are looking for pole stars, is one of them the use of money or the acquisition of money as a profit from the use? And I get back to the taping of something in your home for your personal use, as against taping it for showing for profit. People obviously think the latter is an infringement, the former is questionable.

Is the use of the person's property for individual gain anywhere a pole star in this swamp?

Mr. COATES. I think it is mixed. Now, take the case of the symphony orchestra performing. Who are the drivers behind record protection? It is not the symphony orchestra. It is the company that presses the platters. The symphony orchestra, I am sure, would be delighted to have its music heard far and wide and build its reputation that way. That reward is probably more significant for them than is the royalty from the platter, although the intermediate group, the union, enters into that in an interesting way.

I think in many cases the original creator is the one who ends up being shortchanged in almost every regard. If you make software for IBM, a billion dollar operation, and you are John Brooks, one of their software geniuses, you are probably paid on the order of tens or maybe a hundred thousand bucks. So it is the original creator who almost always gets relatively shortchanged.

Mr. **Mazzoli**. So in some cases when we think we are protecting the creator, we are just protecting the middleman through copyright?

Mr. **Coates**. Yes; I am not saying it is not legitimate, but recognize what you are doing.

Mr. **Mazzoli**. I thank the gentleman and I thank the committee.

Mr. **Kastenmeier**. Let me confer with my colleagues. We have a quorum call on. Is it your desire to stay and ask questions or would you care to come back after a 10-minute recess?

Mr. **Mazzoli**. I will come back.

Mr. **Kastenmeier**. We can proceed for a few minutes if you like.

Mr. **Sawyer**. I don't have very much if you are recognizing me.

Mr. **Kastenmeier**. I yield to the gentleman from Michigan.

Mr. **Sawyer**. Can you give me an example, and it doesn't have to be anything that is exclusive or anything else, but what are an example or examples of restructuring of the copyright system?

I don't know if I grasp the concept, really.

Mr. **Coates**. Let us go back to the notion of what are you trying to protect. Let us say I produce a piece of music. What is copyrighted are several things along the way: The music itself, a particular performance as embodied in a record or a tape or something like that.

You basically protect the book, the record, the sheet music, and so on.

It is the physical embodiment of the intellectual product that you protect.

The fundamental change that is occurring is that we need not have physical embodiments any longer which fit the model of what you are protecting. When you can have complete convertibility and literally make a product invisible, what is it that you want to protect? Do you want to protect the physical embodiment? Do you want to protect the original product? Do you want to protect the point at which it is used?

That seems to me to be one of the controversies that you should engage. My sense of the shift is that you should be moving from the physical embodiment to the capability. In some cases you still want the physical embodiment but in many cases it is the capability, what is inside the electronic box that you want to protect.

Mr. **Sawyer**. I yield back.

Mr. **Kastenmeier**. The gentlewoman from Colorado.

Mrs. **Schroeder**. I thank you, Mr. Chairman, and I am sorry I won't be able to return because we have DOD on the floor which is another committee that I sit on.

One of the things that I worry about as I listened to you is I think we are tending to reflect our culturist technology junkies. I mean, the machines we are all talking about, the taping machines, and the computer machines, and all of those things, they are all going to be protected. But it is almost like there won't be any there.

What is going to be the incentive to put something into that machine?

What is going to be the incentive to put the Bible in the box if we don't find some way legally to protect intellectual property as much as we do physical?

I think that is the real problem that I have as I look for this balance between the two things. We don't mind paying for the patent rights on all the things on the machines but we get really upset about the tapes or the intellectual property. We must keep a balance.

Mr. **Kastenmeier**. If the gentlewoman will yield, perhaps the Bible isn't the best example of protected works.

Mrs. **Schroeder**. That's true, I guess they don't need a copyright on that.

I do think that there are many other things, music and so forth, where it is very difficult to say that that is of a lesser order than designing a machine.

Mr. **Coates**. I think one of the things to keep in mind as part of a long-term trend which I hadn't mentioned, is that much of the creativity in the United States and in the rest of the world is increasingly done in an institutional framework. And those institutions are the mechanisms which often provide the reward.

For example, the software generators at IBM are working in an institutional context.

Mrs. **Schroeder**. If I can yield, we do have to leave at the second bell. My response to that is yes, but part of the reason is the institution isn't doing it because they love artists. They are doing it because they get remuneration back.

Second, I am not sure we want to say, well, all artists have to go to work for institutions. It is like saying, OK, artist, go find a king that will support you, or find a church to have you paint or you can't paint.

I think you are forcing us into that kind of mind set and I worry about that.

Again, I apologize for having to leave but if you could put stuff in the record countering them I would be very appreciative because that really troubles me.

Mr. **Coates**. That would be fun to do.

Mrs. **Schroeder**. It troubles me a lot.

Thank you.

Mr. **Kastenmeier**. We will recess but I encourage the gentlewoman from Colorado and the gentleman from Michigan to return. In addition to Mr. Coates, we have Professor Lange who will be our next witness after the recess.

Mr. Coates, if you are able to stay for a few minutes, I would also appreciate it, because I have a couple of additional questions.

Mr. **Coates**. How long do you think that will be?

Mr. **Kastenmeier**. Ten minutes.

Mr. **Coates**. Fine, thank you.

Mr. **Kastenmeier**. The committee will be in recess for 10 minutes.

[Recess.]

Mr. **Kastenmeier**. The committee will come to order.

I am not sure we will have many other members here. The reprimand question is being taken up on the floor.

Thank you for staying, Mr. Coates, I appreciate it. I just have a couple of questions, but since some of the colloquy did deal with these things, I wanted to discuss them with you.

Those of you who testify, in fact, are likely to be authors in a traditional sense. But I would observe that increasingly, as we move into this new information age, the identification of the author is in doubt, often even as to whether there is an author or work. The fact is that we are, I think, increasingly facing a society in which those who contribute to creation will be nameless.

That is to say that increasingly the proprietors of copyrighted material are not creative individuals anymore but are major corporate entities.

One of the typical cases is whether an NFL football game is an intellectual work, whether it has an author, and whether it should be protected. Increasingly in the programing which has developed, even for entertainment purposes, it is probable that you will not be able to identify a single author for protection.

Mr. **Coates**. I think there are two things to keep in mind here reflecting two trends which are both real and seemingly moving in opposite directions. Let me note that the proposal has even been put forward that Nobel prizes should be awarded to teams, not to individuals or mere pairs of people.

The team and the collective group as the source of development is very real. That reflects the growth and the central importance of large institutions in our society. The trend will undoubtedly continue.

But running right parallel with that is a new and in some ways more exciting trend—an explosive growth in small production of all sorts. There are about 15,000 publishers of newspapers, books, and periodicals and thousands of others producing newsletters and other ephemeris; publishers, not just working in publishing firms, but publishers.

We have the production of artistic works in very small lots. It is not unthinkable in terms of some of these new technologies that a poet might be able to produce 300 copies of his poems; an artist might be well able to produce 300 copies or reproductions of a sculpture or painting. Certainly people will provide specialty software, one, two, three versions of it, for selected customers.

But paralleling the development of new production in large institutions is this exciting parallel development in small to tiny organizational settings.

I think the committee needs to be aware of both of those in its deliberations.

We, in some way, have less to be concerned about in protecting IBM, General Motors, and General Electric than we do in protecting the small and mid-size producer and purveyor of new information.

Mr. **Kastenmeier**. Can that distinction be reflected in copyright law?

Mr. **Coates**. I don't know. I think you have got to go back to the question of what it is you are trying to protect. That is the core question. We have mentioned several different aspects of that question: Are you protecting only physical embodiments, or are you protecting capability; are you protecting rights to acknowledgement; are you protecting the rights to label; are you protecting the rights over a scope of activity, and so on?

I think these are all legitimate questions that you have to ponder.

Mr. **Kastenmeier**. Another question is: there is a reference to computers and privacy and whether copyrighted material will be accessible might there be tendencies to hide masses of copyrighted works in computers to which there is very little access. Now, maybe that won't make very much money for the owners or authors of that material. Isn't there a danger that there will not be accessibility to copyrighted works because of the medium, that is, because of the format, or process, or whatever.

Mr. **Coates**. Almost certainly some materials will fall in that category. But I don't think that can be a generic problem. It will be an idiosyncratic situation.

My sense of the way technology is developing in the use of information is that the more we promote the technology, the lower costs become and the more readily available, the greater the market for a spread of products of varying qualities. Just a guess; maybe 10 percent of the users will go for the grub reproduction, low cost, steal-it-if-you-can model. But that is no problem.

What happens as the market expands is that most people's taste and preferences will go up, not down. And they will want a product that is produced in a better or best possible format.

The future ought not be guided by the grubs of the world but ought to be guided by the social opportunities implicit in mass information being available in a mass society. The grub situation is self-limiting.

Mr. **Kastenmeier**. Certainly the means of communication, the signals themselves, are invisible. I guess we have thousands of signals in the atmosphere that are available to be either received or intercepted, which NASA does on a routine basis, such as free radio broadcasts, or pay television signals, or gradations in between.

One of the problems will be, presumably, unauthorized interception of those signals.

Do you have any observations to make about interception of signals?

Mr. **Coates**. That could very well be, again, a marginal problem, irksome, but marginal.

Suppose you took the newspaper as the model for the future dissemination of information in the mode you are talking about. Newspapers don't pay their own way for the 15 or 25 cents you plunk down on the newsstand. Newspapers pay their way because people put advertising in them. As this sector matures, the service may be marketed free for the ancillary and additional information that is carried by it.

We are in a transition period. It is not at all clear the way the marketing of this high density information will go.

The other side of this question it is useful to keep in mind is that in terms of broadcast, we are talking about the cost of broadcasting falling into the basement with 50 to 100 channels available. The problem will not be people stealing your material. It will be do you have anything worthwhile to say, that anyone will want to listen to or to view.

There will be tremendous quality competition. The competition in one form will find vast numbers of small users seeking other small numbers of users to form special networks.

My sense of the future runs counter to the corporate model of how this is evolving.

Mr. **Kastenmeier**. The question was asked what role the copyright law and intellectual property protection play, or should play, in the future. My colleagues raised the question whether semiconductor chips should be afforded some sort of patent, copyright, or design protection.

But the fact remains that we have advanced thus far with no protection.

Mr. **Coates**. There are two aspects to that problem. One is that the concept of patent and the concept of copyright are converging. It is not at all clear whether that convergence implies scrapping and starting over or reshuffling the deck and reassigning things from copyright to patent and patent to copyright.

The second aspect goes back to the point I made earlier: Do you want to provide the copyright for the physical embodiment? Or do you want to provide copyright around capability?

If it is at all feasible to do it in terms of capability, that would be the far more socially significant mode in which to frame it.

Mr. **Kastenmeier**. I was questioning whether protection is needed at all, whether it isn't overstated. If you can literally manufacture something even though it theoretically would be protectable and if you can put it out on the market, you can still prosper even though you may not have some form of——

Mr. **Coates**. From the trend toward integration of the global economy, much of American industry faces a real threat from the Chinese copies—low cost production of any kind of electronics, semiconductor, physical embodiment, in Hong Kong, Taiwan, Korea, Singapore, and Malaysia.

It is not only real but growing. In terms of international trade and international marketing, some attention has to be given to that question.

Mr. **Kastenmeier**. My last question is on anticipating and developing images of the future. I think Mr. Mazzoli dealt with that for a moment.

How are we to do this? How are we as a committee, or a Congress, or as people interested in the question, to develop a common image of the future in which we can anticipate copyright needs?

Mr. **Coates**. There are two ways to do it. One is to look at the process side of what you might do. How do you draw forth more witnesses? How do you commission studies? How do you get the Federal agencies to do things? How do you get inputs from interested parties?

That process side you, obviously, could pursue.

It seems to me, however, that the important thing is what you want to get out of those images of the future.

There are some anchor points for planning. I suggested two of them earlier. One is that the technology is totally interchangeable and, therefore, one can see anything produced and coming from, and being manipulated by a variety of media. That gives a very informing sense of the future.

The second image I suggest was that the investment per capita is going to be severalfold higher. It is moving to center place in our domestic economy.

A third kind of anchor point that one would get out of these deliberations is that the technology is intrinsically democratizing. The democratizing aspects of the technology ought to be encouraged, not thwarted, by any kind of constraints you put on it. This is the sense of the intellectual information commons.

Out of the deliberations and creating images of the future, you can develop more of these anchor point concepts. They would inform your legislation.

Mr. **Kastenmeier.** Thank you for that guidance. We very deeply appreciate your testimony here today.

Mr. **Coates.** Thanks for having me.

Mr. **Kastenmeier.** Our last witness today is Prof. David Lange. Professor Lange has taught at Duke University School of Law since 1971. His area of expertise is intellectual property, communications, and entertainment law.

He brings with him a diverse experience. Prior to becoming a teacher of law he was a partner in a motion picture production firm, a practicing lawyer, and a public servant. He was in fact chief counsel to the mass media task force, National Commission on Causes and Prevention of Violence.

Professor, it is a pleasure to greet you and we are most pleased to hear from you.

TESTIMONY OF DAVID LANGE, PROFESSOR OF LAW, DUKE UNIVERSITY SCHOOL OF LAW

Mr. **Lange.** Thank you, Mr. Chairman.

I welcome this opportunity. I can assure you that I appear before you suitably chastened by the parting remarks of my two 14-year-old sons who told me as I was leaving, that if this committee hoped to elicit expert testimony, then surely in my case some mistake must have been made.

I told them I thought the question was essentially existential and that, in any case, I wanted them to spend the day cleaning up the yard.

Meanwhile, I do have some remarks to bring you and, unlike Mr. Coates, I am sufficiently rooted in the past—and take copyright and intellectual property law to be sufficiently well established—that what I really propose, Mr. Chairman, is just to comment on how I think the existing system might approach the problems posed by new technology and to suggest some of the presumptions and challenges to new technology that I think you and the members of your subcommittee might suitably bring to people who want to extend copyright interests or who want to have new copyright for some new technology.

In short, I don't propose any kind of grand renovation of copyright. Having just finished 15 years in that effort yourself not long ago, I am sure you would not welcome that kind of undertaking and, indeed, I must say, I don't think it is necessary.

The copyright law as it now exists and has existed since January of 1978 is suitable in the main for the kinds of copyright interests that it protects.

I don't mean to say that I think it is easy always to apply copyright principles. Certainly, as you know, copyright principles are very difficult to decide in particular cases.

But the law doesn't work badly and there is no particular reason, in my judgment, why the law ought to be radically revised or why, in effect, we ought to have to reinvent the wheel in order to decide whether or not to do something about particular technologies.

My view is that in approaching the subject matter of new technology, we need to keep in mind the bargain that we strike when we allow a copyright proprietor to have a copyright interest. The bargain is that in the long term, in exchange for that temporary protection, we expect to have whatever it is that is the subject matter of that creative expression passed into the public domain where it then becomes part of the yeasty materials from which we invent new works.

It is the public domain that I think is most seriously threatened when new technology and new ideas for protection in new technology are raised. There is always the prospect of striking a bad bargain.

But I do not mean to sound any kind of dramatic note or to suggest the death knell of what Mr. Coates calls the intellectual commons, which I think is the same as I imagine when I use the term the public domain.

I think that if we are careful and if we are willing to allow new ideas to be brought on against the background of what I have called in my testimony a civil common procedure, we can allow the questions of new interests to be raised and argued out in the security of knowing that we won't allow these interests to be proliferated too widely or too advantageously unless the necessary burdens of proof have been met and the public domain provided for.

What I have in mind I have proposed in my testimony, which I hope you will receive for the record without my having to read it.

Mr. **Kastenmeier**. Without objection, of course.

Mr. **Lange**. What I have proposed in this testimony is a series of inquiries that I think proponents of protection for new technology ought to have to meet and I begin to list those on page 6 of my prepared statement.

To begin with, Mr. Chairman, it seems to me that if new technology is to have the protection of copyright in some fashion, it ought to first meet a threshold test. The first requirement is that the expression or the embodiment of that technology, ought to sufficiently closely resemble copyright interests that we already have provided for in the law. We should not too greatly stretch the existing constitutional dimensions of copyright and or too sharply break with the kinds of copyright protections that we have in the 1976 general revision.

The analogy that I have in mind is this: It seems to me that if someone wants to call a garment a vest, he ought to have to produce something that doesn't have sleeves. If you are going to wear a garment that has sleeves, then I think you ought to call it something else. It is no longer a vest, I think, in the meaningful sense of the term.

I think that if a new technology is introduced and brought to this subcommittee for protection, then I would suggest that this is the first thing that ought to be inquired. Does this new technology essentially resemble what we have accustomed ourselves to thinking of as the subject matter of copyright and does it result in the kinds of protected expressions that copyright has already proven itself reasonably capable of dealing with? Professor Nimmer, for example, raised this question in the context of micro chips in 1978, in the new technology report.

If the answer to this threshold question is yes, then it seems to me that the proponent ought to go ahead and meet some additional burdens of proof.

If the answer is no, it does not necessarily mean, of course, that no protection ought to be extended to the new interest. It only means that if protection is to come, it probably ought not be copyright.

It may be that a patent is appropriate; it may be that something really new is appropriate for protection. But I don't think that we are required infinitely to stretch the boundaries of copyright law in order to accommodate interests and technology which are simply not within the fair province of copyright as we can sensibly deal with that subject.

Now, if I begin to sound as though I am hidebound and rigid and incapable of responding to anything new, I assure you I don't mean to. I am quite capable of accepting new media of expression; and perfectly willing to entertain the idea of new subject matters of copyright. But I think it is fair to raise the threshold question that Professor Nimmer did.

So the initial question is whether the new technology is fairly within the framework of what we are accustomed to thinking of as copyright? And if it is, then we can proceed to some secondary questions.

The secondary questions could be framed in any number of ways. I have suggested five questions in my prepared statement that I think the proponent of a new interest ought to have to meet.

The first, it seems to me, is this: Is the subject matter newly to be protected by copyright susceptible to a definition that will allow us to come to some sensible common understanding of it?

Is the expression that is to be protected capable of a definition that will allow people to understand where the boundaries of that copyright lie and what the dimensions of the copyright are?

A second question that I think that proponent ought to meet is whether the new protected interests can be set off against that part of the public domain which remains unaffected? In other words, can we complete the job of defining the new interests so that we both understand what it is that is to be newly protected and, also, what it is that is to remain in the province of the public domain?

Those seem to me to be two questions that every proponent of new or extended protection ought to have to answer. And I think there ought to be something amounting to a burden of proof here, that is, if these two requirements cannot be met, if the definitions cannot be made satisfactory, then it seems to me that the presumption ought to be that the interest is not entitled to new copyright protection.

The third question that I propose in my testimony is that the proponent ought to undertake what amounts to a competitive analysis of the costs and benefits of new protection. For example, consider the "first sale" doctrine and whether or not it ought to be revised in the case of motion picture or audio cassettes.

It may well be that it ought to be changed, but if so, then it seems to me that the proponents of the change ought to be required to show not only why they should have the benefit of the change but also why the members of the existing tape rental industry ought to bear the adverse consequences.

In short, I think that in our rush to entertain the idea of new technology and new interests, we ought not necessarily allow those interests which have sprung up in reliance on rights in the public domain to be too easily thrust aside. And, again, I think the presumption ought to be against rather than in favor of extending a new kind of protection.

Fourth, I have suggested that any proponent of new interests ought to be able to show clearly how that interest ultimately will enrich or enhance the public domain. If the transaction in copyright is one in which we presuppose that ultimately the public domain will be enhanced, then I suggest it is fair that every proponent of a new or extended interest in copyright ought to show how that interest ultimately will benefit the public domain.

Generally speaking, that burden will be easy to discharge if you can show that some kind of new creativity is involved. But if we are dealing with something more nearly in the nature of derivative rights or if we are dealing with a new medium of expression or an existing kind of expression not importing much new in the nature of creativity, then I think from the perspective of the public domain, new protection is more difficult to justify.

Finally, I have suggested a burden that ought to be borne by a proponent of new legislation which in a sense echoes the threshold tests that I have already proposed.

In general, a proponent of a new interest ought to have to show that the interest can fit harmoniously into the existing scheme of copyright without radical revision or excision of existing provisions.

If a new interest can be protected in copyright only by balkanizing the existing field of law, then, while it may well be that new and separate protection ought to be recognized, it does not follow that that protection ought to be called copyright or that it ought to take its place within the provisions sections generally covered by title 17.

My suggestion in this testimony, then, in short, is that proponents of new interests or extended interests ought to be encouraged to come forward but I don't think that it ought to be the obligation of Congress or this subcommittee to have to defend against a refusal to extend legislation I don't think this subcommittee ought to have to apologize if it decides to say no. In effect, I think the burden ought to be on the proponents of the new interests, or the extended interests, to show why those interests ought to be newly protected.

If they can meet these requirements, then the copyright law can sensibly be revised. If not, then I suggest to you, Mr. Chairman, that the copyright law cannot sensibly be revised. And while it may well be that you will nonetheless wish to revise it, I think then you will have to find a new basis for the revision.

I think at that point we begin to test the constitutional dimensions of the law of statutory copyright and I do think at that point it is fair to put on the brakes before we extend these provisions of law.

I have summarized the contents of my testimony, Mr. Chairman, in the hope that I can save you and the other members of the committee some time in the hearing today. Meanwhile, I would be very glad to respond to questions if you have some on what I have said or on something else that has been said in earlier testimony.

[The statement of Mr. Lange follows:]

Statement of David Lange, Professor of Law, Duke University

Mr. Chairman, members of the subcommittee, and staff. I am grateful for your invitation to appear today. I welcome this opportunity to comment on some of the issues that can arise when the law of copyright comes face to face with the challenges of new technology. I do not intend to address the particular problems posed by individual technologies. Instead, I will first briefly review the general tensions between copyright and the public domain, I will then suggest how these tensions can be aggravated by efforts to gain copyright recognition for new technology, and finally I will offer an outline of some of the questions that proponents of new copyright legislation ought to be prepared to answer and some presumptions they ought to be prepared to overcome.

As you know, copyright is an amalgam of property law principles bent to the service of a rather simple bargain. A limited term of protection against copying is granted to an author's original expression in exchange for the dedication of that expression to the public domain at the end of the term. The public ordinarily benefits at least twice from this bargain: once, when the original expression is first created, and then again when the expression is added to the public domain from which anyone may borrow freely to fashion new works. Although a copyright belongs to an author during its term, the ultimate purpose of this bargain is not to protect authors but rather to enrich the public domain. The cardinal principal in copyright law, then, is that any decision to extend the law or to recognize new interests ought to be based on a realistic expectation that one day the public domain will bear new fruit.

If the law were as simple as this bargain, there would be few occasions for betrayal of the public domain. Unfortunately, however, though the bargain is simple in concept, it is the essence of complexity in practice. Property law is inherently difficult. Worse, there are terms of art at work in this field of law which are as defiant of conventional understanding as the idea of a vest with sleeves. Speak of writing and the ordinary person thinks of words on a page; but in copyright terminology, a "writing" takes on constitutional dimensions. It may include music, painting and sculpture, as well as photography, motion pictures, sound recordings and more. Similarly, the idea of an "original" expression must be understood as having a distinctive copyright significance. Creativity, in the conventional sense, plays only a minor role in copyright law. What "originality" requires is not invention (which is more nearly the separate province of patent law) but rather an absence of copying. And so it goes from one peculiar term to the next. In copyright law we have a complex system of rules made even more complex by an ad hoc terminology. The potential for confusion is immense. And when there is discord the loudest voices tend to be raised in the service of particular copyright interests rather than on behalf of the public domain.

An additional, intensely human phenomenon also accounts for the occasional betrayal of the public domain. The bargain between an author and the public, so simple and gratifying when first struck, can appear virtually Faustian as the end of a copyright term approaches. Few proprietors of successful works can brave the passage of those works into the public domain with a simple show of cheerful equanimity. To the contrary, copyright lawyers are often asked to play the role of Daniel Webster as they seek some imaginative way to cheat the Devil and avoid the public domain. The consequence of these undertakings is a hellish collection of intellectual property theories just beyond the edges of copyright -- theories in unfair competition, trade secrets, rights of publicity, trademarks and the like -- which the inventive lawyer relies on in an effort to keep the author's property in his work alive forever.

Beyond these commonplace occasions for betrayal of the public domain, there is the still more pervasive fact that the subject matter of this species of property is completely intangible. A book in its physical form is something we can see and touch; but the copyright in that book is an abstraction beyond the evidence of our senses. We "see" a copyright only imperfectly, inexactly, as a kind of reflection in our mind's eye. To be sure, when we speak of a personal property interest in the physical copy of a book, we have to understand that legal conception of property as an abstraction -- but at least we understand what the subject matter of the property interest is. Our senses tell us what the book feels like, what it looks like, how much it weighs and so on. In copyright, however, the unavoidable conceptual complexities inherent in all property law are magnified many times by the fact that no one can ever be sure that anyone else understands the subject matter of the law in the same way. I show you copies of two novels -- one, Moby Dick by Herman Melville; the other, Jaws by Peter Benchley. Anyone who can see can tell one copy from the other. But no one can be sure whether Jaws itself is a "copy" of Moby Dick in the sense in which that term is used in copyright. We can agree on the consequences of copying -- at least enough to be able to make some sense of the law -- but as to the fact of copying itself we must always entertain some doubt. Our senses cannot help us and our minds may differ.

Of course, these troublesome attributes of copyright have not kept it from evolving into a subject of great practical utility. Our conceptual grasp of the law sometimes exceeds our practical grasp of definitions -- sometimes, like Mr. Justice Stewart in the obscenity cases, we must content ourselves with "knowing" a copyrightable interest only when we "see" it. If we are not unduly distressed by the role intuition must then play in the law, we can get by. But there is still an unusual and nagging potential for misunderstanding in the law of copyright, a vulnerability which is particularly apt to result in betrayal of the public domain when this law is subjected to the stresses and pressures that accompany efforts to secure recognition for new technology.

The betrayals I have in mind are likely to take one of two forms. On the one hand it is possible that an interest will receive insufficient recognition in law because it is insufficiently recognized in fact. Choreography once was excluded from the full protection of copyright on just this ground. An art form inadequately understood by most of us in its own terms, it was protected under the 1909 Act only when presented in a form of expression we could appreciate. Sound recordings are another example of expression which the law of copyright may once have rejected because of an unwillingness to come to terms with a peculiarity in the medium of expression itself. Indeed, it might be said that sound recordings offer the best example of what can happen when the law of copyright fails to meet the challenge of a new technology so that a legitimate form of expression fails in turn to achieve adequate recognition and protection. Arguably, had it not been for the passage of the Sound Recording Amendment of 1971, the vulnerability of the recording industry to "piracy" might have brought that industry to ruin. I do not mean to endorse this argument; I merely acknowledge its plausibility in order to make a point beyond it -- namely, that insufficient copyright protection can mean reduced incentives to the production of expression and thus ultimately reduced contributions to the public domain.

A more serious form of betrayal, however, takes place when an interest is protected which ought not be -- or when an interest is given excessive or misconceived protection. In either case something may then be withheld from the public domain which properly belongs there. And in either case, technology may be implicated in the error. I think, for example, that if the technology of the chromolithograph had not distracted Mr. Justice Holmes (in Bleistein v. Donaldson Lithographing Co., 188 U.S. 239 (1903)) he might have written a more thoughtful opinion on the eligibility of advertising for copyright protection. More recently, in a case involving the sole motion picture record of the assassination of President Kennedy (Time, Inc. v. Bernard Geis & Associates, 293 F. Supp. 130 (S.D.N.Y. 1968)), the court might have come to a more secure conclusion had it understood that public access to the event itself could not possibly be foreclosed by the law of copyright -- in other words, had the court understood that the copyright owner's claims in that case were profoundly misconceived.

In these examples and many others, the law of copyright has failed to respond adequately to the challenges posed from time to time by new technology. In the deepest sense, perhaps, the explanation for these failures may be found in the intangibility of the subject matter of copyright and the vulnerability of the law to misunderstanding. This dilemma is inherent in the subject and cannot altogether be avoided. And yet, because a mistake in copyright law is potentially quite serious, with adverse consequences for the public domain running well beyond the initial mistake itself, it is important that we attempt to meet each new copyright proposal with the most painstaking efforts at careful, independent analysis. In one sense, to be sure, that analysis inevitably must be ad hoc. Precisely for that reason, however, it ought to be undertaken against a rigorous background of procedure agreed upon in advance and applied uniformly from case to case.

In effect, what I propose is a kind of civil procedure for new copyright legislation -- a system imposing the legislative equivalent of burdens of proof and adverse presumptions to be met by anyone who proposes to extend the scope of existing copyright protection or who proposes protection for a new interest. For the latter kind of proponent, there might well be additional threshold tests intended to identify those new forms of expression which are sufficiently like existing copyright interests to deserve further consideration. No proposal ought to be rejected out of hand merely because it involves expression in a new form. If the expression is otherwise conceptually akin to the established subject matter of copyright, if it meets at least the established minimum requirements of originality, and if the new medium can be seen as reasonably analogous to the established "writings" which are the province of statutory copyright, then it would seem that the proponent ought to have at least an attentive audience as he argues the new interest's entitlement to recognition. I would suggest, however, that even when these threshold requirements have been met, the new interest ought to face a stiff challenge amounting to a heavy burden of proof and a clear presumption against recognition. Each new copyright interest, by definition, represents a potential encroachment into the territory of the public domain. No new interest ought ever to be recognized unless and until the consequences of that encroachment have been explored in the fullest practical sense. It is reasonable to require the proponent of a new interest to bear the burden of showing why any intrusion into the public domain ought to be allowed -- and equally reasonable to presume that the public domain will be protected until that burden has been discharged.

How, then, can the proponent of a new interest meet this additional burden and overcome the presumption against recognition? First, I would suggest, he must demonstrate the susceptibility of the new expression to a reasonably clear and satisfactory statutory definition -- and, equally important, to a clear, common conceptual understanding -- so that the dimensions of the resulting copyright are intelligible. An interest that cannot be defined and cannot be understood probably should not be made the subject of copyright protection. Computer programs in FORTRAN or BASIC, for example, probably meet this test; but programs in microchip reduction may not.

Second, a proponent must succeed not merely in defining the interest in an affirmative sense; he should be able to define it as well in terms of what it is not. No new interest should be recognized unless the public domain adjacent to that interest is fully redefined and reaffirmed. If, for example, it proves necessary to legislate in the so-called field of "home recording" it will be equally important to affirm the nature of those private rights which are not to be affected. Copyright is an essentially provincial field of law; it ought not be permitted to encroach too far or too easily into private lives.

Third, a proponent ought to be expected to sponsor a careful competitive analysis of all the costs and benefits of the proposed legislation. If, for example, the motion picture industry is to suggest that the "first sale" doctrine ought to be revised in the case of video cassettes, then it must also explain how and why the tape rental industry should bear the adverse consequences, if any, of that change. What may be at stake in a case like this are economic interests developed in reliance on a well-established concept amounting to a vested interest in the public domain. If so, it will not ordinarily be sufficient merely to say that the proposed legislation will extend the benefits of copyright to existing proprietors or make them more secure. To the contrary, unless a superior claim can be shown on some other ground, the interest derived from the public domain should prevail. Even dire warnings about the likelihood of industry-wide retrenchment should not lead automatically to changes in the copyright law. Copyright can be an efficient form of institutional bargain, but it is not intended to save buggy-whip manufacturers from ruin.

Fourth, a proponent should be able to show how the new legislation ultimately will enhance the public domain. Unless this is likely to be a practical consequence, new or extended protection will be unwarranted.

Finally, a proponent must be able to defend the new interest in terms of all of the principal provisions of the copyright law -- or else suggest how ad hoc provisions can be fashioned which will meet the more particular requirements of the new interest without simultaneously converting the entire field into Balkan provinces. If, for example, microchip programs are to claim the protection of copyright, should all provisions of the present law apply? Should the term of protection be the same as it is for conventional books written by conventional authors? Should these programs be impressed with some form of compulsory license? Should the provisions for remedies be revised? If the answers to these and similar questions require substantial rewriting of the existing Act, then it is likely that the law of copyright ought not to extend to this form of interest. After all, when a garment requires sleeves it makes little sense to call it a vest.

In outlining these questions, and in suggesting the propriety of others like them, I do not suppose that Congress or this subcommittee ought to be bound by any rigid approach to the delicate task of decision-making. I intend merely to describe the general nature of a procedure that ought to attend the passage of new copyright legislation. Ordinarily, a proponent ought to bear the burden of establishing the need for the legislation against the weight of an adverse presumption. The ultimate issues will not necessarily be easier to resolve, but the interposition of that presumption will make it less likely that the public domain will be ignored or too easily thrust aside as new interests and new technologies command increasing attention.

Mr. Kastenmeier. Thank you, Professor Lange. You have been very helpful. What you have done, of course, is deal a little more specifically with the subject matter that actually does come before us to enable us to think about these things.

So I guess maybe some of the questions I will ask would be different from those I would ask the other witnesses.

Do you have any sense, for example, that the increased resort to compulsory license in the copyright law is, in the long term, a superior device; or do you think that it is in basic conflict with the concepts of copyright law?

In other words, I am asking: There appears to be a trend where increasingly industrial interests will clash and there is an accommodation, rather than allowing one set of parties to become fully liable under existing law, or not liable at all.

The accommodation may commonly include a compulsory license because it represents a meeting ground for which there may be agreement.

I guess I am asking what is your reaction to that in terms of the copyright law?

Mr. Lange. I understand, as Congressman Mazzoli pointed out earlier in the hearings this morning, that from the point of view of the subcommittee and from the point of view of Congress, there is some need to be political about these questions. And I don't mean in general to denounce either that impulse or the corresponding impulse to compromise.

But I will tell you frankly, Mr. Chairman, my own reaction is that, generally speaking, these questions would be better resolved by either saying yes or no. And here is the way I see this: Professor Compaine described this area of new technology as, in some sense a swamp. You can say that.

But my own sense of copyright today is that it is more nearly like a large family in which a lot of greedy children are constantly coming to their parents asking for something new. Sometimes I think we have to deal with greedy children just by saying no; no, there will be no movie this afternoon; no, you will not go to the ice cream parlor—and so on. Sometimes, of course, you may want to say yes.

But I don't think you can always say, well, you may go to the ice cream parlor and eat half a cone, and then you can see half a movie. I don't think you are really fulfilling your responsibilities as a parent when you behave that way too frequently. Frankly, though I realize that the thought may be easier for me than it is for Members of Congress, I think too much compromise is not a particularly desirable thing. It avoids facing up squarely to the real gut-level issues in a very complex and difficult area in law.

So in general, no, I would not be in favor of many more compulsory licenses.

There is one other practical reason and, of course, you know better than I, when you set up a compulsory license mechanism, you have to have some basis for parceling out the proceeds. Well, I don't need to tell you how that works.

The truth is that when you set up a method for parceling out the proceeds of the compulsory license, there—if Mr. Coates is worried about legislation or judicial action—that is what is going to hang you up. I mean, who is going to be content with his share of what comes out of those licenses? There are some great practical problems in that.

Mr. KASTENMEIER. But since we will confront a series of questions in years to come, in addition to those we know about today, in terms of the equities of copyright proprietors, new technology, users, and so forth, inevitably there will be these conflicts. I suppose the temptation will be to deal equitably with the parties rather than simply to rationalize in terms of what the law would seem to presume.

The reason I raise the compulsory license question is because we have created a Copyright Royalty Tribunal and we have caused some of the problems you allude to in terms of distribution and allocation. We tend to create bureaucracies and we tend to create additional transactional costs, more layers to clear. At what point does this become oppressive?

Mr. LANGE. I think very quickly it becomes oppressive, and unworkable. If a legislative response doesn't actually work, then in a sense it is not a legislative response.

Now, please do not misunderstand me, Mr. Chairman. I think the 1976 copyright revision, all things considered, is a magnificent work. But in the compulsory license provisions, I think it probably is at its weakest. I understand the background of that controversy; and I understand how compromise was sought, and finally accepted by all of the principal parties to it. I don't mean to denounce that particular compromise in the act. But as an instrument of legislative policymaking in the future, I think that it is one that ought to be sparingly used.

I think that kind of compromise in the field of copyright truly doesn't work very well.

What I would suggest in line with my recommendations in this testimony, is that if that kind of compromise seems inevitable then I would suggest that it may be one of those cases in which the burden of proof has not been met, and that the protection simply ought to be denied.

I have had some background on both sides—I had better say on all sides of this: from the point of view of someone who is interested in protecting a copyright interest and also from the point of view of someone who has interest in representing those who have copyright interests; and from the point of view now of someone who thinks about copyright.

Biting the bullet and saying no—or saying if you are going to have a deal with us, you are going to have to bring us a better worked-out proposal than you have brought us—may seem hard in the moment and may lead to a lot of anguished cries, but in the long term I think it is better policy, better legislative policy in this field.

Mr. KASTENMEIER. I would like also to invite your comment in another area in which the views of the two preceding witnesses differed, and that is on the rule of the courts. I do think that, generally speaking, particularly where the matter is so contestable that it ends up in the Supreme Court, that it usually is not an ultimately satisfactory solution.

That doesn't say it may temporarily put to rest the litigious matter before it but it does not resolve industry questions and other questions that remain, and does not usually go very far beyond the four corners of the proposition put to it at an earlier point in the case.

I guess my question really is, what sort of role do you see for the courts as questions evolve with respect to the new technology and copyright protection? Is it sort of only an occasional, reluctant role, never resulting in full resolution of the questions, or do we have to rely exclusively on other forms of conflict resolution?

Mr. LANGE. I tell you, Mr. Chairman, I don't think that there is such a thing as a quick form of conflict resolution where the conflict is serious and where each side is willing to fight. With many of these issues, I don't see any speedy forum for resolving the conflicts.

We could move to something like dispute resolution centers, for example, or enforced arbitration and mediation services. I still think, to be frank, that in all of the hardest cases which are the ones that really drag through the courts the longest, we would likely end up with some form of judicial test anyway.

To be equally frank with you, however, I don't see that as such a bad thing. I don't mean that I like long court delays or the inconclusiveness of litigation—of course I don't. I wish that it could be otherwise.

But in order for each side to have what is ultimately a fair hearing on the very specific kinds of disputes that came up against the background of even the best legislation, I am hard pressed to think that we have much alternative to the courts as means for resolving those disputes.

I know that at the law school we are establishing a so-called dispute resolution center, and I am in favor of the experiment. But I have practiced law and been a lawyer long enough to have my doubts about the viability of that experiment. I think we simply have to wait and see. Meanwhile, I don't think that court tests are necessarily such a bad thing.

The *Betamax* litigation, I will grant you, had been a particularly exacerbated example of litigation.

I think part of the problem there has been inadequate lawyering on both sides. It is a plain fact that in the briefs in that case, one of the most obvious preliminary questions is whether the reproduction right in section 106 even applies to home recording.

Now, I don't just mean home audio, or home video tape recording, but applies to any kind of private copying, has actually not been addressed to the Court, despite the fact that there is a perfectly legitimate argument to be made that it does not—an argument that Alan Latman advanced in the first of the studies on copyright in the fair use context back in the late fifties, an argument that ties very nicely back into the earliest form of the language that we used in section 106. The argument in brief, and I know you don't want to hear this at any length, but the argument in brief is that the reproduction right may well mean only the right again to produce, which is to say to communicate publicly. No kind of ordinary home copying for private use is in that sense a reproduction. It is, instead, a copying which is not necessarily what is meant by reproduction as that term is susceptible, at least to construction in section 106.

Now, I realize when I argue this to you, of all people, Mr. Chairman, I do have to confront the reality that you may have a different opinion of the meaning of section 106 and the reproduction right, but I am only suggesting there are some inadequacies in the briefing in the *Betamax* case which I think has dragged that litigation on longer than it ought to. And I gather from what the Court has just done that at least there is some sentiment in agreement with that in the Court itself.

You know, most cases don't drag on the way the *Betamax* litigation has done.

Mr. KASTENMEIER. Well, paradoxically, it has been observed that there has been more sheer talent brought to bear by both sides of this controversy than in almost anything else in a long time. So yours is a very interesting observation.

On the issue of public domain, I wasn't clear how you were using the phrase when you stated that a proponent should be able to show how the new legislation ultimately will enhance the public domain. I don't know whether you referred to it as that area into which expired copyrighted works fall or whether you are referring to public interest generally.

Mr. LANGE. I think that public interest and the public domain may sometimes coincide but I am really using it in a somewhat more technical, intellectual property sense, more nearly like the first of the two possibilities you suggest.

I don't think of it as just a repository for expired interests, however. I think it is important not to. I think of the public domain also as everything that is not subject to some kind of intellectual property protection—as ideas, for example, at least in the copyright area, are not subject to protection.

They are part of the public domain, not because they pass from expression after expiration of the copyright into the public domain, but because they are never taken out of the public domain in the first place. It is in that somewhat larger sense that I am using that term.

Mr. KASTENMEIER. You were commenting on the 1976 law, by and large, favorably, but since I did raise the question of term earlier, I will raise it with you as well.

Given the nature of that which we expect to see copyrighted or protected in the future, do you think that the terms are realistic?

Mr. LANGE. I think they are on the long side, quite frankly. I think it might have been better if the term had remained somewhat shorter, or even perhaps been shortened rather than extended.

I understand the arguments in favor of extending it but generally I would favor a shorter term.

Mr. KASTENMEIER. The most powerful argument we heard on the issue of term was that we should bring it in conformity with the Berne Convention and internationally this is the direction we were going.

I feel, however, that if we had had a much shorter renewal period like 7 years, wherein all the copyrighted works would fall because there is no utility in long-term protection, it would have been a much more useful endeavor. What we did was extend everybody's protection whether they ever needed it or not.

Mr. **Lange**. I agree with you, and I suppose it is not too late to have another bite at that part of the apple. But, of course, the theorist counterargument is that there is then a threat that a work will be forfeited and injected into the public domain through some inattention or through some mistakes as sometimes did happen.

It seems to me that that is a legitimate concern but one to which you could fashion an adequate response by making the renewal almost mistake-proof.

As I gather, what you would like to have is a copyright term that can go up to an average of 75 years if someone is really affirmatively inclined to take it that long, but understanding that most people won't be, you would let most interests lapse. That makes perfectly good sense.

Mr. **Kastenmeier**. Yes; I think we could make it nearly mistake-proof. We could even require an affirmative act to let it lapse, for example.

Let me ask you a question that I think I asked the first witness and that the second witness answered without being asked.

Do you think society is better served if the law responds to changes, particularly in technology as related to copyright, as changes occur or if the law tries to anticipate changes?

Mr. **Lange**. I think you should do both. I think you should anticipate change by having clearly in mind what you will require of people who then want you to respond to specific proposals.

That is why I am suggesting that something—of course I don't mean this in a literal sense—but something akin to a civil procedure with burdens and presumptions would allow you to tell people upon what terms they could hope to have new copyrightable interests. Once the procedure is in place, then, I think it does become more nearly a matter of responding to new technologies as they are sufficiently developed to be defined.

Mr. **Kastenmeier**. Do you see things happening by inadvertence, that is to say, technology and practices overtaking the 1976 law to produce unintended results in terms of protection or nonprotection?

Mr. **Lange**. Do I see that coming?

Mr. **Kastenmeier**. Do you see this now in some situations?

Mr. **Lange**. Yes; in the area of home taping, for example, I think that is basicallly what is happening.

I also think that the library accords on fair use are not working very well.

But in the main, it seems to me, the Copyright Act is working pretty well. There are some gaps, some parts of it that don't address current needs but I don't think it is working all that badly right now.

If I may say one more thing about that or enlarge on that response a bit. When you think about the specific proposals that are coming to your committee right now, they really are rather specific, parochial requests.

For example an amendment of the first sale doctrine in the context of video cassettes is linked, I grant you, to technological change, but it is not fundamentally implicated in any great movement in society. This is a very specific response that is being asked for by one segment of the protected users or protected copyright proprietors.

I am not convinced in short that the act is yet under quite the strains that some of the more sweeping statements today might make it seem.

Mr. Kastenmeier. Do you think that we should make changes in the copyright law for purposes of rectifying what appear to be major economic problems within certain industries?

Mr. Lange. Should the law be amended to do that?

Mr. Kastenmeier. Yes; that is to say possibly in some cases abandoning, or at least not primarily being concerned with, copyright principles; should we make amendments in the law to, say, benefit jukebox operators, or a declining record industry, or take care of musicians who are displaced by some form of music technology, or X, Y, or Z—should these be considerations that might be reflected in copyright law?

Mr. Lange. They are fair considerations but it doesn't automatically follow that the law ought to be changed. I mean, to some extent, as I said in the testimony, I don't think the copyright law has to protect buggy whip manufacturers from passing on into oblivion.

There are times when an industry may simply have to change its marketing strategies or turn to something else.

But, yes, of course it is fair for the copyright law to entertain arguments on behalf of one industry or another for change. I think those changes ought to come, however, only if the proponents of the change can show both why they are entitled to it and why, as against their entitlement, someone else who may now be benefited by the law the way it is, ought to have to bear the burden of that change. Because generally, there is a tradeoff involved.

Mr. Kastenmeier. In other words, something more than economic need?

Mr. Lange. Something more than unilateral economic need.

Mr. Kastenmeier. The last question: Do you have any comments on possible changes in criminal law to provide enhanced criminal penalties for copyright violations?

Do you have any particular notions or feelings about resorting to criminal penalties for violations of the copyright law?

Mr. Lange. My opinion is that in general, criminal penalties are not a particularly effective, or in legal philosophical terms, a particularly desirable way to enforce copyright interests.

I don't find the present terms of the law particularly objectionable in themselves but I certainly wouldn't argue in favor of expanding, or increasing them.

Mr. Kastenmeier. One of the problems has been that enforcement by the Justice Department has been relatively infrequent.

It has also been argued that one of the reasons for it is that the penalties are not very great, therefore, U.S. attorneys do not see these as compelling criminal cases to pursue. Of course, it is like getting into an escalating war. If a 1-year prison term and $50,000 fine isn't enough, make it 3 years and $100,000. I am not sure that that solves the problem.

That's all the questions I have.

You have been very, very helpful. I apologize to you that my colleagues are not able to be here. We will attempt to insure that your statement is read by them and will come to their attention. Certainly, they would feel as indebted to you as I for your testimony today.

Thank you.

Mr. LANGE. Thank you.

Mr. KASTENMEIER. That concludes today's hearing. We will convene tomorrow for further hearings on copyright and technological change at 10 o'clock in the same room. There will be two witnesses tomorrow and until that time the committee stands adjourned.

[Whereupon, at 1:25 p.m., the subcommittee was recessed, to reconvene at 10 a.m., Thursday, July 21, 1983.]

COPYRIGHT AND TECHNOLOGICAL CHANGE

THURSDAY, JULY 21, 1983

House of Representatives,
Subcommittee on Courts, Civil Liberties,
and Constitutional Rights
of the Committee on the Judiciary,
Washington, DC.

The subcommittee met, pursuant to call, at 10 a.m., in room 2226, Rayburn House Office Building, Hon. Robert W. Kastenmeier (chairman of the subcommittee) presiding.

Present: Representatives Kastenmeier, Mazzoli, Glickman, Moorhead, and DeWine.

Staff present: Michael J. Remington, chief counsel; Deborah Leavy, assistant counsel; Thomas E. Mooney, associate counsel; and Audrey K. Marcus, clerk.

Mr. **Kastenmeier**. The subcommittee will come to order.

This morning the subcommittee is continuing its hearings on copyright and technological change.

Our first witness will be Dr. Fred Weingarten, who is program manager of the communication and information technologies program at the Office of Technology Assessment [OTA]. OTA is an agency of the Congress responsible for performing long-term analysis of technological trends and their impact on public policy. Dr. Weingarten, who has an undergraduate degree in engineering and a doctorate in mathematics, has gained a reputation as an expert in information policy.

We are very pleased to greet you, Dr. Weingarten. You may proceed as you wish.

TESTIMONY OF FREDERICK WEINGARTEN, PROGRAM MANAGER, COMMUNICATION AND INFORMATION TECHNOLOGIES PROGRAM, OFFICE OF TECHNOLOGY ASSESSMENT

Mr. **Weingarten**. Thank you, Mr. Chairman.

I would like to submit my written testimony for the record, and then comment on it and discuss it more informally.

Mr. **Kastenmeier**. Without objection, your 16-page statement will be received and made a part of the record. You may proceed.

Mr. **Weingarten**. Thank you.

Mr. Chairman, I am the program manager for communication and information technologies at the Office of Technology Assessment. The Office of Technology Assessment, of course, is an analytical arm of the Congress. We are administered by a Technology Assessment Board that is chaired at this time by Congressman Udall, and has five other distinguished Members of the House of Representatives on the Board, and six Senators. Our Vice Chairman is Senator Stevens.

There are nine programs of the Office, of which my program is concerned with all telecommunications and information policy issues. We have done a number of studies during the last 2 or 3 years that have addressed various aspects of public policy and computer technology.

Mr. **Kastenmeier**. If I may interrupt, we have a very significant document here, dated November 1982, and entitled "Informational Technology and Its Impact on American Education."

Mr. **Weingarten**. Yes, sir. In fact, I brought that along myself. Thank you very much. I am particularly proud of that study because I was the project director for that study.

Mr. **Kastenmeier**. I am pointing this out not for your benefit, but for the record and for the audience.

Actually, I guess our question is informational technology and its interface with American copyright law and proprietary issues.

Mr. **Weingarten**. In fact, those issues tend to arise in a number of studies we do. In fact, in that study we address very briefly certain questions of intellectual property protection—don't come to a lot of conclusions, but raise the questions of whether those problems with those laws, in fact, affect in that case the production of educational software and educational materials.

Several of our advisory panel members, advisers from industry, in fact pointed to some problems in that area. I will refer to them and, in fact, come back to them a little later.

We also published somewhat earlier than that, in October, a report, "Computer-Based National Information Systems," which was the initial report from the CIT program. In that report, we did an extensive survey of the trends on technology and the development of the industry, and tried to track out for the Congress a number of issues in a broad sense that we though the next decade would confront the Congress with, and intellectual property, once again, was designated as one of those issues.

I would like to structure my testimony in two pieces: One, talk about some trends, not just in the technology, but in the industry that stands in back of that technology—and second, raise some questions for which I don't really have any ready answers at this time. I would like to point out for the record that OTA has not done a study in the copyright area or in intellectual property. Therefore, what I have to say does not constitute findings or opinions of our Board or of OTA. But I am appearing here mainly to describe the state of technology and to raise some questions that might be significant.

Mr. **Kastenmeier**. You have, I think, done some studies on patents in the pharmaceutical industry's——

Mr. **Weingarten**. Yes, sir. We have published a technical memorandum on the patent term extension.

Mr. **Kastenmeier**. Yes.

Mr. **Weingarten**. That particularly focused on the drug industry.

We also have in press a larger study of patents and new technology. In both cases, those did not really address information technology issues per se.

Mr. **Kastenmeier.** I can see that. But it is in that large intellectual property area. You have done some things relating to patents which have been useful to this subcommittee.

Mr. **Weingarten.** Yes, sir, that is correct. A patent study is in press now and should be out shortly.

When attempting to paint a picture of what is happening technologically, we are right in the middle of an extremely complex time, rapid innovation, rapid introduction of new products, changes, new inventions coming on the market every month, and it is very hard to pull out of all of these strands of activity certain key patterns that are taking place. A recitation of all of the technologies coming on the market really isn't, in my opinion, useful for policy analysis.

So what I have tried to do here is to identify what I consider to be five very significant trends within the area of information and telecommunications, and then tie those to the questions that this committee has before it.

The first principal trend or characteristic of the technology that I described is what I call the variety of choice. In the past, the business person, the homeowner, had a number of technologies that perhaps you could count on one hand—a television set, a telephone and, in business, large main-frame computers, and so on.

What we have happening now is an incredible proliferation of technologies in all these areas to provide new kinds of services and to do old kinds of jobs in a different way.

For instance, in communications, plain old telephone service—what they used to call POTS—is being replaced by a variety of specialized information communication services at the local levels, technologies for tying together word processors, personal computers, and business computers within a building, new technologies for communicating within a region, in a city, or cable television or broadcast technologies, and long distance, even worldwide communications systems, designed to facilitate video conferencing, audio conferencing, computer data transmission. An incredible variety of alternatives are now facing the communicator.

In a similar way the computer market is diverging. We are all aware, of course, of the recent developments in personal computers, desk-top computers. OTA itself is currently going through a significant change in that area as we move toward using personal computers for our analyses.

In the area of television or video services, the standard network broadcasting services are being supplemented by cable. In the near future, low-power broadcasting, direct-broadcast satellites, and other forms of technologies are going to bring a much wider variety of programing and entertainment services to the home.

There are also new technologies that I think may be particularly important for the copyright area, new technologies for creating programing. I refer to computer graphics and other types of computer-generated information systems.

Finally, there are new types of information services that are currently at the level of experimentation in the United States—Teletext, Videotext—that in some European countries are further along in implementation, but that promise to bring new types of information products and services directly into the home.

Finally, one point that I didn't raise in my written testimony, but I should like to point out, is that all of these services are being integrated. We have not just a selection of independent technologies, but these technologies are working together and, in some cases, are being physically interconnected. That integration raises certain kinds of problems, I think, in the intellectual property area.

One example might be the increased attention or importance of the *Betamax* case that is enhanced by the development of new cable and the potential for direct broadcast satellites and new kinds of pay television services that are providing newer and more valuable movies directly into the home. Those services, coupled with the VCR technology, are what create more tension and more conflict in that area. So it is the interaction of technologies as much as the individual technologies that create problems in this area.

Another trend is the transformation of information to electronic digital form. The digital form is important because digital is the form in which information can be processed by computer. Electronic is important because it diverges from traditional views of information as something tangible on a piece of paper or a painting on a wall or a piece of sheet music, identifiable pieces of information. It is now in electronic form. In that sense, it is hard to identify, it is hard to see, you can't read it. You can't even tell in some cases as it is flowing through a distributed system where it is or how many copies there are of it.

I am not speaking so much about the disappearance of paper. Most people don't anticipate in the near future that we will move to a paperless society. But even those information products that result in paper—magazines, newspapers, even books—these days, originate in electronic form. When OTA prepares a report, it sends discs, magnetic discs, to the GPO, from which printed paper reports are made. So the original form of that information is electronic.

Another trend is the rise of the information marketplace. Of course, information has always been sold. Newspapers are centuries old, pamphlets, and books. On the other hand, what we see is a strong shift toward the growth of this marketplace as a significant sector of our economy.

Some futurists will even maintain that by the end of the century, an advanced society will spend most of its employment, most of its time, and most of its economy, in the production of information, the sale of information, the export of information and the use of information.

One of the problems we have is that we don't really know yet or understand well the behavior of a marketplace for information. Information is a commodity that can be bought and sold, stolen, whatever. It is different from tangible goods that have been traded in the past. Economists are now trying to understand and develop an economic model of how one values information and how this marketplace operates. It really differs from the past.

I want to now move from hardware to software. In this future marketplace, it is not the technology that is important so much as the software that comes along with the technology. That is the really economically significant good we are talking about—not video cassette units as video cassette units, but video cassette units as players of programing that then is purchased by another segment of the industry.

In the computer area firms with large computers now typically spend four times as much for computer software as they do for the hardware in their installations. We expect that sort of ratio will eventually trickle down even to the small computer.

The final trend that is going to raise some significant issues in the area of intellectual property is the internationalization of information technology. Direct-broadcast satellites, high-power radio stations, and television stations don't observe national boundaries very well. Video discs, video tapes, audiotapes can be transported easily across borders. International telecommunication systems are being increasingly interlinked. That is almost an inevitable trend, because the value of a telecommunications system is enhanced by the number of links it has. So there has been a continual force toward building an internationally linked telecommunications system.

That trend means that the flow of information across national boundaries is less and less controllable, and that there are more and more incentives to encourage that flow. I would expect that international trade in information products is going to be an increasingly significant portion of our economy and of the world's economy.

These five trends lead me to a number of questions for which, as I said before, I don't have answers. But it seems to me that the committee really has a very difficult but fascinating challenge in front of it.

Mr. **Kastenmeier**. You need not apologize for not having the answers. We wanted you to raise the questions and, if you can respond, answers will be a bonus. But you are not required to provide answers.

Mr. **Weingarten**. In this case, I don't have any.

I think of the most important issues that we raised in the education report, in the context of education, is the balance of societal interests between the increasing marketplace of information and the tendency of that marketplace to lock up information and make it available on an economic basis. It seemed to us to provide a challenge to traditional views of information as a public good. We have always had this conflict.

What we suggested was that the technology and the trends toward this marketplace seemed to be increasing that conflict, raising again the need to readdress the question of the boundary.

The stakes on both sides of the equation are higher. As information products and information technology become a major part of our economy, obviously the need to protect that marketplace and to encourage innovation and encourage that economy to grow, become increasingly important.

At the same time, for individuals in our society, the need to have access to information and to the ability to use information, seem to be higher. We will need to know more to hold a job. We will need to know more to function as citizens in our society. Certainly, in a political sense, in order for citizens to make informed judgments on the important issues before us, they need more and more information. So it is in the national good, and has always been considered that, that information flow freely. That conflict between social goals is likely to become intensified. It seems to me that one of the points of that conflict is in the area of intellectual property protection.

The second question I raise is the feasibility of even protecting information legally. In general terms, can we control this new material? And in the specific context of copyright, patent law and so on, does it apply to electronic information? What is it we are trying to protect? Who is it we want to preserve rights to or give property rights to?

We have already come to a time when millions of computers are in homes. The cost of copying machines is dropping. Already Xerox is advertising an in-home copier. That is certainly a trend that will continue. The video cassette unit is another example. All of these technologies provide people with the ability to copy information—and not only to copy information from other sources, but modify it, to change it to their own tastes or needs. It seems to be a significant question whether traditional laws or traditional approaches to protecting proprietary interests in information are even feasible in light of this vast democratization of information technology.

The next question is the potential for market distortion. In other words, a lot of new technologies and new services are coming on line every year. There is going to be intense competition, and it is unlikely that they are all going to win. If they all win, we will end up with 150 channels of information into our home, more services than we could spend 24 hours in a day using. So some will win, and some will lose. It seems to me that there is a potential that the structure of intellectual property law will in fact determine, inadvertently or deliberately, those winners or losers.

So there are really two issues: Whether, as this committee considers individual pieces of legislation for specific technologies or specific areas, the bills might inadvertently distort the market or favor one technology or another; and the second issue is whether there are certain societal interests that could, in fact, be enhanced by structuring the law in one way or another.

We point out in the education report that some providers or potential providers of education software stated that, in the absence of what they perceive to be adequate protection, they would concentrate their efforts on video games and other kinds of short-term payoffs, mass market applications of computer software, rather than concentrate on what they saw as a very narrow market and a long-term payoff in very expensive softwear in the educational area. We didn't determine whether that claim was true, but it was an assertion by some members of the industry.

So that raises the question whether or not, in fact, there are certain societal goals that could be encouraged by the proper modification or development of intellectual property law.

The final issue or question is the relationship of copyright law specifically with a vast range of law designed to affect information and to vest property rights in information and to control, somehow, that marketplace.

In the education study, we raised five—patents, copyright, trade secrets, the law of unfair competition, and trademarks—to which I would add also the computer crime and even privacy law, for the privacy law also is an attempt to legislatively control or vest some property rights in certain kinds of information.

In any consideration of copyright legislation, it seems to me that this committee needs to balance this specific form of protection against other alternate forms, including computer crime law, and including the possibility of technological controls mitigating against any need for a modification of the law. In other words, one could argue, "We'll let the technologists and the industry figure out how to protect their information on their own. Encryption and various other kinds of computer security technologies will take care of certain types of piracy problems if the industry is left to itself."

Mr. **Kastenmeier**. If I may interrupt, would you restate the five areas of law to which you added computer crime legislation?

Mr. **Weingarten**. And privacy. Yes, sir. There were patents, copyrights, trade secrets, the law of unfair competition—which, evidently has been used to protect information—and trademark.

Mr. **Kastenmeier**. Thank you.

Mr. **Weingarten**. To that, I added computer crime and privacy.

Mr. **Kastenmeier**. You could probably also add regulation by the FCC. That certainly is a limiting factor on property rights, which doesn't really fall in any of those categories.

Mr. **Weingarten**. Yes, sir. Then there is a much broader category of laws that affect the technology and the way it is used and the kinds of information that are transmitted across it. The FCC certainly does regulate. I think they try to avoid it, when possible, but they do regulate content.

Another question that came to my mind last night after this testimony had been written, but one that I first ran into at the National Science Foundation as a program director, is the issue of the Government interest in information products and services that are developed by the Government.

At the National Science Foundation, very often my grantees would be developing data bases or programs that it would be in the interests of the scientific community to put into the public domain, to give to other scientists working in the same area. Yet, in some sense, to put them into the public domain would end up competing with proprietary services offering similar or related services. I would suspect that the issue is growing in importance, because the computer program marketplaces are growing in importance.

In conclusion, I suggest that the Congress in general and the subcommittee specifically needs to take a broad perspective of the legislation in front of it. I line out three dimensions to that breadth.

One is technologically. We need to look at all dimensions of technological change and not focus on one technology at a time and try to somehow put in a patch for this technology and a patch for that technology, et cetera.

The second dimension is the pace of change, or time. Technology and services are changing so fast in this area that, in many cases, they are outpacing the legislative process. If one focuses too much on very current problems, by the time the law is modified to correct that problem, the problem no longer exists because we have another type of problem, we have another kind of service, another kind of technology has come up to modify it and, in a sense, outpace the legislative process.

The third dimension of breadth is the mechanisms we chose to protect the information—whether we choose to create entirely new mechanisms to deal with electronic information or the various forms of knowledge in order to encourage innovation or do we try to modify specific pieces of law. What we found in the education study was that currently there is a patchwork with a lot of gaps in between. The overall picture may show adequate coverage, but the pattern needs to be considered.

Finally, we need to consider the international arena. The laws that we pass now in this country that affect the creation and use of information inevitably conflict or affect our relationships with other countries, because information and information flow is becoming inherently an international phenomenon.

Mr. Chairman, over the next few years, your subcommittee has a complex and a very fascinating task ahead of it, and OTA is pleased to help in any way it can. Even though I was asked to only raise questions, I will try to answer those you might have.

Thank you.

[The statement of Mr. Weingarten follows:]

TESTIMONY OF FRED W. WEINGARTEN
PROGRAM MANAGER, COMMUNICATION AND INFORMATION TECHNOLOGIES PROGRAM
OFFICE OF TECHNOLOGY ASSESSMENT
BEFORE THE SUBCOMMITTEE ON COURTS, CIVIL LIBERTIES
AND THE ADMINISTRATION OF JUSTICE
OF THE HOUSE COMMITTEE ON THE JUDICIARY

NEW INFORMATION TECHNOLOGY AND COPYRIGHTS

JULY 21, 1983

Mr. Chairman, it is a pleasure to appear before your Subcommittee today to discuss some of the fast-paced trends in information technology and to help you explore some of the implications of those trends for the legal system that seeks to protect intellectual property.

I am the Program Manager for the Communication and Information Technologies (CIT) Program of the Office of Technology Assessment (OTA). I am a computer scientist by training and have spent many years examining the social impacts of information systems, as a college professor, as a Program Director with the National Science Foundation, and, now as OTA's Program Manager for Communication and Information Technologies.

I must preface my remarks by pointing out that OTA has not performed a full assessment of information technology and copyright, per se. However, nearly all of the studies undertaken in the CIT Program require that we keep close tabs on technological trends. Hence, in the testimony today I can provide some technological background and raise some important questions and issues that this Subcommittee might consider exploring.

A number of OTA studies have touched on the topic of copyright protection, and they have, on occasion, raised intellectual property issues that OTA regards as important and worthy of consideration by Congress. For example, in the report Computer-Based National Information Systems, OTA projected future developments in computer technology and developed a general overview of the relevant policy issues that would confront Congress over the next decade. Briefly discussing computer software protection, OTA concluded:

> "... the issue of computer software protection appears sufficiently important and unsettled to warrant continued congressional attention."

In the report Informational Technology and Its Impact on American Education, we looked to see whether the lack of adequate protection for computer software and data bases might be a barrier to the development of computer-based curriculum. OTA compared and evaluated the use of five basic types of protection: trade secrets, trademarks, patents, the law of unfair competition, and copyrights. Each of these mechanisms appears to protect information to some degree -- some more than others -- but each also has significant limitations. Three specific questions regarding educational software were raised:

- How should software be protected, while recognizing the competing interests of groups who use software or benefit from its use?
- How can piracy and the various types of misappropriation of software be better dealt with?
- How can the incentives be increased for software innovation, especially educational software, given the limitations and costliness of the existing remedies for its protection.

TECHNOLOGICAL TRENDS

It has become common in the press and popular literature to speak about the new "Information Society" or "Information Age." Whether or not such statements suffer from journalistic exaggeration, we are clearly in the middle of a fundamental transformation of the way information is created, stored, transmitted, and used, not just in our own society, but world-wide. These changes are based on rapid technological advances in both computers and communications which have been brought about by progress in such fundamental areas as microelectronics, photonics, and satellites. These advances are providing us with a vast smorgasbord of new products and services.

But change in technology, per se, is only part of the story. Along with technological innovation, we are experiencing changes in the way that technology is used and offered in the marketplace. These changes in industry structure may generate as many public policy issues -- particularly with respect to the area of intellectual property -- as does the technology itself. Both trends must be taken into account.

I will concentrate on five areas of change that seem most relevant to the purposes of this Subcommittee:

1. The variety of choice.
2. The increasing storage and use of information in electronic form.
3. The enhanced social and economic value of information.
4. The changing marketplace.
5. The internationalization of information technology and services.

After briefly describing these changes, I will outline some possible issues and policy questions to which these trends may give rise.

Variety of Choice

One way in which intellectual property has always been protected has been to keep it secret or to make it exclusive. Before the advent of public libraries, for example, often only scholars or other select groups of individuals had access to collections of books, documents, and manuscripts. Similarly, today in some cases, we limit access of information to those who own it or who can pay for it as in the case of proprietary information and commercial data bases. The increased availability and diversity of new information technologies will enhance public access to information. Thus the protection of some forms of intellectual property (may be undermined).

Not so long ago, if we were average home or business consumers of information technology we had only a few choices open to us. For communication services, we had, what is referred to in the telephone community as POTS (for Plain Old Telephone Service). For video, we had a relatively few channels of broadcast television. For audio, AM and FM radio, plus records and magnetic tape were our choices. Computers were large, expensive beasts and there were relatively few in number (at least as compared with current figures).

Now look at what is or will soon be happening.

Under the stimulus of technology and deregulation, vendors are bringing to market a wide variety of specialized communication services. There are local networks for use within an office to tie together word processors, desk-top computers, and mainframe computers. Specialized carriers are eginning to provide new media that compete with the telephone company's "local loop" of copper wire. Cellular radio offers low cost and widely available mobile telephone service. Two-way interactive cable, originally conceived of as a system to distribute television programming, is being adapted to provide data communication for business transactions. AT&T and its competitors are all developing new enhanced long distance services, based on satellites, fiber optics, or even an old fashioned microwave radio. By the next century, communications engineers see us as approaching what they refer to as an Integrated Services Digital Network (ISDN), in which one can transmit information of any type (voice, video, facsimile, computer data) at high speed between any two points on earth -- all over an interconnected network.

A similar diversity also characterizes the computer market. Supercomputers, large mainframes, mini's, and desk-top or personal computers are all commercially available. At the smallest end of the scale, it becomes hard for a consumer to even recognize that he or she is purchasing a computer -- microprocessors are now standard components of a myriad of products. The capability of these machines continue to grow rapidly with performance/cost ratios nearly doubling every two years.

For television watchers, traditional broadcasting is now being challenged by two-way cable, low power broadcast, direct broadcast satellites, multipoint distribution, video disks (both optical and capacitance), video cassettes and, in the future, high definition television. Audio technology is experiencing new competition. AM stereo is becoming available and an audio laser disk has recently been introduced to the market.

We should not leave out of this list the advent of new technologies for the creation of video and audio programming. Computer graphics are coming of age as far as they are becoming increasingly cost-effective for commercial producers to invest in very large scale computer capacity to generate graphical imagery. (Supercomputer manufacturers cite the entertainment industry as a new market for their machines.) Much advertising that we see on television depends on computer graphics, as do the high tech special effects of movies such as "Tron." Some graphics experts say that we are within a decade of being able to create fully realistic images, even of people, by computer graphs. In the same way, sound generation is advancing for applications that range from the creative -- providing a new medium for performance, to the more mundane -- as a cost effective replacement for a human voice.

All of these new technologies supplement, extend, or improve in some sense existing information services provided to the home or office. Some other proposed services and products seem to be new in concept, as well. For example, Teletext and Videotext services will not only provide to the home or office terminal access to information in a new form but also a host of new types of services. Promoters are already experimenting with electronic news, in-house shopping and banking, and electronic mail. Remote medical consultation, education, and other social services could also be provided.

Electronic Digital Information

Because many of the new information and communications technologies will require that information can be handled in an electronic and digital form less and less information will be maintained in traditional paper form.* Office automation will accelerate this trend. With the proliferation of word processors and personal desk-top computers new information will originate in an electronic form, with paper being used for copies. Automated tellers, supermarket checkout systems, and other computer-based transaction systems also collect and create information in digital electronic form. Moreover, all forms of information -- telephone conversations, audio and video recordings, photographs, and television signals -- can and, in the future, will be stored, communicated and accessed in electronic digital form.

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* The term "Digital" is a technical term that refers to information that is stored or transmitted in the form of binary bits.

Because electronic information is vulnerable in new ways -- for example, such as systems failure and misappropriation -- this increased use of information in electronic form has implications for the protection of intellectual property. And intellectual property laws, designed to protect information stored on paper, may become increasingly less effective in an electronic age.

The Information Market

In part spurred by technological innovation, we are experiencing the rapid growth of a market for information. On the demand side, for example, business is starting to view information and knowledge as a critical factor of production. Innovation, the creation of new products and services, both generates and is based on the use of information. Some futurists even maintain that, by the end of this century, most workers will be employed in an information, or knowledge, industry and that information will be the principal export commodity from any highly industrialized nation. A major problem that affects many public policy questions including that of intellectual property rights is how to measure the value of information as a market commodity.

The challenge for intellectual property legislation will be in protecting the content of information systems. Computers need programs and data.

Broadcasters need programming. Videotex providers need information services. We use the term "software" to refer to this content. In somewhat simplified terms, software is the information processed and delivered by information technology.

By many measures, it seems reasonable to expect that software will be much more important in our future economy than hardware. For many, if not most, information technologies, the market resembles that for razors and blades; few machines and many programs. Video game suppliers have been operating on this theory since they first came to market. Large computer installations, have long passed the crossover point where investments in software outweigh those in hardware. Some estimates place the ratio at four dollars of investment in software for every dollar invested in hardware. As a result, the commercial market for computer software is growing rapidly. One market research group predicts, for example, that computer software sales in the U.S. will triple from $4.5 to $13.5 billion by 1986. While owners of small computers are not yet to the point of such major proportional investments in software, they are expected to approach it over the next few years. Moreover, providing information services and producing information software entails a growing proportion of employment. In 1982, the Bureau of Labor Statistics estimates that over 751 thousand people were working as programmers and system analysts -- far more than those employed to manufacture computers.

Changing Industrial Structure

Intellectual property issues will also be affected by changes in the structure of the information industry, many of which will be due to actions taken by the Federal Government. The most significant of these changes will be in the direction of increased competition. Although the impact of these changes are bound to be significant, their exact nature is still unclear.

The best known change is the deregulation and break-up of AT&T. Deregulation will, in effect, allow the entry of eight very large firms into the information product and services industry (those firms being AT&T and the seven regional operating companies.) The expectation and hope of those promoting deregulation is that; with the research and manufacturing capability of the telephone companies released in the competitive marketplace, the rate of innovation and marketing of new products and services will be accelerated.

Also, the recent tendency of the FCC to allow for greater freedom in the use of the radio spectrum will have a major impact on the structure of several markets. For example, private radio communication systems will bypass, and increasingly compete with, local telephone facilities.

The structure of the domestic industry will also be affected by increased international competition. Whereas in the past, the United States has held an unchallengeable lead in innovation in information technology, competition has picked up considerably. In the hardware market, we are already long past the point where foreign nations follow our lead. In computers, Japanese firms are now competitive at all levels. In consumer electronics, the Japanese have led the way in VCR and, now, audio optical disk technology. The French and British, among others, have been in the forefront in developing Teletext and Videotext. There is no reason to believe that competition will not become equally severe in the software areas, raising the economic stakes for U.S. firms and increasing the pace of innovation.

Internationalization of Information Technology

Information systems are becoming increasingly international. In the first place, the technology is, in some sense, inherently international in that it ignores national boundaries. Broadcast satellites and high-power radio and television transmitters regularly spill across national boundaries. And the value of telecommunications systems is enhanced when they are interconnected. Hence, there has always been an incentive to connect systems across national boundaries, an incentive reflected in the current move toward the ISDN.

The International market for programming will continue to grow. Broadcasters, seeking to fill an insatiable supply of entertainment and information channels with video programming are turning to foreign sources and are, in turn, selling U.S. programs abroad. The BBC has long been a cultural mainstay of American Public Broadcasting, and the British have a fascination for Dallas, but that market will broaden substantially.

Faced with these trends, international diplomacy and commerce is increasingly finding that international information flow and trade pose important and very difficult problems among nations. Among these problems are questions pertaining to the protection of intellectual property.

QUESTIONS AND IMPLICATIONS

The advance of technology, the changing industry structure, and the enhanced value of information raise a number of questions about the protection of intellectual property. Given the conflict of basic interests involved -- the future of the U.S. economy, fairness, and the needs to preserve the basic rights of citizens, these issues need to be explored by Congress when considering legislation affecting intellectual property.

Balance of Societal Interests

In an information age, the social and political value of information and knowledge will be enhanced. And individuals, if they are to effectively participate in and equitably share the benefits of an information society, will need to have greater access to knowledge and information. The door to social and economic opportunity will be more widely open to the literate -- to those who have access to and know how to use information resources. Yet, as OTA pointed out in its education report, the trend toward an information marketplace, where more and more information is bought and sold, could overrun those public interests and create a new underclass based on lack of access to education and to information.

American concerns have traditionally sought to provide free public access to information. Public libraries were predicated on that belief. For example, many of the public libraries built by Andrew Carnegie at the turn of the century have above their doors the phrase "Free to All." Similarly, public schools, dating back to the 1860's, were created in the belief that only an educated, literate society can govern itself.

In ancient China the public's right to information was provided for in a somewhat different fashion. I have been told, for example, that in China at that time it was not considerd a crime to steal a book. The story may be apocraphal, but the point it illustrates is valid.

While social and political concerns may call for providing increased access to information, economic concerns may call for greater information protection and exclusivity. Earlier, for example, we observed that information technology and, in particular, information products and services, are becoming major components of the U.S. economy. The implication of that observation is that policies that encourage the innovation and the development of that industry are vital to the health of the U.S. economy. Certainly, the information industry argues that strengthened protection of its inventions is vital to stimulating the development of new product and services.

Intellectual property law addresses the conflict between the need to protect rights to information in order to increase the incentive for innovation and the need to insure the freest possible flow of information. In an information society, the stakes are higher on both sides of that equation and mechanisms for protection of intellectual property become both more important and more difficult.

Feasibility of Protection

Given the changing nature of information, the trends in information and communications technologies, and the changing nature of the information market, a number of fundamental questions are raised about our ability to effectively control the use of information in traditional ways. There are a number of problems with the traditional mechanisms:

- Information in electronic form does not seem to fit comfortably into the centuries old models that underlie intellectual property protection.

- The growth in "value" of information raises the incentive to "steal" it.

- Technology, widely and inexpensively available, carries with it the capability of misappropriating it. The personal computer, the VCR, the audio cassette, soon even the in-home Xerox machine, all provide easy access for illicit copying.

Given these problems, we may need to develop new techniques to protect intellectual property that are more appropriate to electronic technologies.

Potential Market Distortions

One of the most noticeable characteristics of information technology is the trend toward an extraordinary diversity of products and services. Some of these will compete directly with each other, some will offer significant differences. All, however, will be in competition for limited consumer and business dollars, and not all will survive the test of the marketplace. In this intensely competitive marketplace, with large sums at stake, firms will be looking for any advantage. In some cases, they will see the ability to protect their information products as providing an important competitive edge.

Changes in the copyright law may favor one product or service, or one technology or type of company over another. A public policy question arises as to the extent that Congress should consciously try to influence that outcome or should concentrate on trying to provide a "neutral playing field" for the competitors. In our education study, for example, some publishers told us that, in the absence of adequate copyright protections, they would continue to concentrate on the mass market for video games rather than on more expensive, longer payoff educational software.

Related Laws and Alternatives

Copyright is only one area of law now struggling to remain relevant in the face of changes in information technology and the need to protect property interests. OTA's education study listed five areas of law. To the list of five presented earlier, I would add a sixth, computer crime legislation -- that is, legislation that specifically makes it a Federal crime to use computers as tools in the conduct of criminal activities.

In addition to legal controls, there are also technological ones. Piracy can be reduced, for example, by encrypting cable and broadcast television signals and by developing more sophisticated copy protection for computer programs. Of course, mitigating against the development of security technology is the growing sophistication of those who wish to break the protection and steal information.

Thus, an important question is the role copyright protection plays with respect to these other forms of control. It may be that certain intellectual property problems brought before this Subcommittee would be better handled through changes in patent law, criminal law, or simply left to the technologists for solution.

CONCLUSION

For the foreseeable future, Congress will be the focus of numerous efforts to modify and update copyright law. Several bills have already been introduced this year and are now under consideration by the Subcommittee. The flow will not likely ease up. These pressures arise, at least in part, both from the rapid advances in information technology and from the growing importance of information and innovation in our society.

In responding to these legislative proposals, Congress will need to adopt a broad perspective that includes at least three dimensions -- 1) technological breadth, 2) pace of change, and 3) mechanism of protection.

Technological Breadth -- The future holds in store for us a wide variety of new information services and new mechanisms for delivering them. While these technologies are diverse, they are similar in so far as their primary utility rests in the "software," or information base that makes them do work, entertain us, or inform us. Hence, copyright law affects them all, and consideration of modifications to that law need to account for the full range of technologies.

Pace of Change -- Rapid change is another characteristic of today's information technology. This change is due both to technological innovation and competition in the marketplace. A very promising product or service may not survive in the marketplace, either because consumers do not want it or because another, even more attractive substitute comes along to take its place. One of the natural hazards of legislating in this environment is that the time frame for legislation is slower than that for innovation. By the time the law is changed, the problem may be different. It will be important to take a long-term view of technological development in assessing legislative options.

Mechanism for Protection -- The notion of protecting information rights is imbedded in a number of laws, ranging from copyright and patents to bills on computer crime and personal privacy. In addition, advances in security technology may allow information producers to protect their products better by controlling their distribution and use. Finally, in the international arena, U.S. protections interact with those of foreign governments. As we experience increasing transnational flows of information, the relationship between U.S. law and those of foreign governments needs to be taken into account. Otherwise, dissonance between those laws may inadvertently disrupt a desired flow of information.

Mr. Chairman, over the next few years your Subcommittee faces a challenging but fascinating task in dealing with the policy issues raised by communication and information systems. OTA is pleased to help in any way that it can. Although my assigned task today was to raise questions, I will be glad to try to answer any questions the Subcommittee might have.

Mr. KASTENMEIER. Thank you very much. You have made a very helpful presentation here this morning and I am very pleased.

I have a number of questions but I will only ask one or two and then yield to my colleagues.

During yesterday's hearing, I asked the witnesses the following question. In the area of copyright with respect to technological change, do you think Congress or this subcommittee should attempt to anticipate change or should we respond to change after it has evidently occurred and problems may arise as a result?

Mr. WEINGARTEN. Well, sir, it is my bias, I suppose because of my institutional allegiances, that we are better off trying to anticipate change in the legislative process than try and chase change.

Change is simply taking place too fast to run along behind. It puts us always behind the eight ball. One can never prognosticate the future perfectly, and one can never somehow answer for all time the issue of how do we protect electronic information. But at the same time I think a better process would be to try and anticipate.

Mr. KASTENMEIER. I would like to yield to my colleagues. I would now like to yield to the gentleman from California, Mr. Moorhead.

Mr. MOORHEAD. Thank you.

This discussion is very, very interesting.

You know, there is one problem that concerns me somewhat in this as we plan for change and we see it happening so rapidly to us, at least on the cutting edge out in front.

There is a vast volume of American activity in the communications fields and in others that doesn't catch up with that front edge that is cutting. And maybe the majority of it lags 5 or 10 years behind. Quite often we stay away from legislation because we say it is changing so fast we can't keep up with it. But these people with very real economic needs are sitting back there in the main volume of activity and nothing is done to take care of them, or for them.

I know this last week, I suppose yesterday, there was a big change, but noticing the stock market on the computer industries they have been well down. Evidently sales or something hasn't been up to expectation to cause that.

I wonder if perhaps as far as the real expectations for the American people, even though the exotic areas—even I heard over the radio this morning that there was a farmer that is computerizing his feed for his cows by computer system from the top of the barn—but for most of the people they aren't there.

Can't we make a mistake in refusing to take care of the needs of that big bulk that is back there just because we are awed by the changes taking place out in front?

Mr. **Weingarten**. I think there is certainly danger of fadism, of seeing a new technology on the cover of Time and thinking that it dominates us. In fact, one of the interesting observations we made in the education report is that there seems to be a stretching out. Whereas, in the past all schools had settled down to a standard traditional pattern, There are now schools that are heavily computerized and schools that are still very traditional. So one, in a sense, sees a stretching out of technology usage and there are some people on the leading edge but a vast bulk of schools that still are operated traditionally.

I think you will see the same occur in office automation. It is a stretching out of some people on the front edge and a bulk of people in the back.

At the same time, these leading edge technologies seem to be very significant for our economy. People suggest that our future societal growth and economic health really rests, at some level at least, on these leading edge technologies.

Mr. **Moorhead**. The one thing that I was intrigued by, also, is were you referring to the telephone system that may be replaced someplace by radio communication and other modern sciences?

What effect is this going to have on our universal telephone system where virtually every man in America has a phone that will tie in with other people's phones? With this system also do you envision to be able to tie in with the present existing telephone system so that we do have that universal system that is so valuable to us?

Mr. **Weingarten**. That is a difficult question and, in fact, it is at the center of some of the debate over deregulation—whether the new system that we are creating in the deregulation that I discussed briefly in my testimony will preserve the universal telephone service or not.

I really have no conclusions on that point. It is an important consideration, particularly at the local network level, whether a number of alternative communication technologies that may skim the profitable cream off of local delivery and effect in a negative way the telephone system. But that is a speculation at this time and there are strong arguments on both sides.

Mr. **Moorhead**. This committee is interested in patent laws as well as we are with copyright and we have found in talking to people from other countries and from the experiences our own corporations have had in marketing their products abroad, and trying to get patents abroad, there is not quite as tight a protection as there is in the United States.

When we talk about putting our computer systems in an international market where there is total interchange and so forth, isn't the protection of our movie picture industry, our programing, our programs that have been on our television systems, and virtually everything that may be in the computers that we have, going to be very difficult to protect in that kind of an atmosphere?

Mr. **Weingarten**. It may be or it may be that they will be difficult to protect by the mechanism of copyright law. There are different attitudes. I was talking a couple of weeks ago to a number of entrepreneurs in England who were developing and selling software products. I asked them whether they felt that there were inadequacies in copyright law in England that were barriers to their innovation.

They didn't understand why I would ask such a question. They didn't look to copyright law to protect their products. They look to manipulating the market in certain ways; to bringing out products fast enough that the piracy was not a problem; to technological controls, and so on. They didn't even think of copyright.

Yet, if you ask the same question in the United States, similar firms will often refer to copyright as a major barrier.

I think there is a difference in attitude and difference to the extent to which Americans and those in other countries look to the copyright law.

Mr. **Moorhead**. Maybe there is a difference in attitude toward the rights of other people, too.

Mr. **Weingarten**. Well, in this case I think that both, U.S. entrepreneurs and English entrepreneurs, have the same incentive, that is to be able to appropriate their rights to the information they create. It is just that they look to different ways to do it.

Mr. **Moorhead**. You have outlined some of the difficulties in providing protection in your speech. One of the things that concerns me, if it does become difficult as we get more and more modern technology, isn't there going to be a tendency to go for the fast buck, the inferior product, perhaps, for the market that can be readily sold, and the money can be obtained for it in a hurry rather than the real quality product that needs more protection for a longer period of time because the people know that it can be literally stolen or pirated from them?

Mr. **Weingarten**. That was raised as an issue when I mentioned the video games, in fact, for the tendency of software firms to produce video games rather than educational curriculum.

Mr. **Moorhead**. I was thinking of it more in the realm of entertainment and many of the other things that we deem so important in the United States. If it can't be protected, people will be very careful about not putting the millions and millions of dollars in it. They will go out after the fast sale and get their money off of the first run. Then we won't have the quality that we used to.

Mr. **Weingarten**. That is certainly a concern and I think it is a major issue that needs to be explored. I think to answer it requires the understanding of the information marketplace I referred to earlier. We really don't understand how the incentives work and how information is handled as an economic good.

Mr. **Moorhead**. I appreciate your presentation. I think that it is as good as any we have had here and we have raised a lot of very important issues that we have to find the best answers we can for them. You have been helpful. I guess my 5 minutes are up.

Thank you.

Mr. **Weingarten**. Thank you.

Mr. **Kastenmeier**. The gentleman from Kentucky.

Mr. **Mazzoli**. Thank you, Mr. Chairman.

Thank you, Mr. Weingarten.

A couple of questions. In the absence of my friend from Michigan, Mr. Sawyer, let me ask the question he usually asks and it is one that I generally agree with, and that is, is a solution here of more reliance on market forces? And I think you were talking to your colleagues or your constituency group in the United Kingdom where they rely on something other than the law: Market forces, other kinds of protection, and the encryption, and whatever else, to protect themselves.

Do you think that that is what we ought to increasingly do and rely less on law to intervene to protect this?

Mr. **Weingarten**. I don't have a conclusion to that, but I think that is very important. Perhaps I should have stressed it a little more as I was summarizing my testimony. I refer in particular to the potential for technological controls and other forms of market behavior to protect interests in the information products.

Mr. **Mazzoli**. Well, because I think you said something a little bit earlier that we cannot, at least in your opinion, try to handle today's problems because no sooner is the law passed which takes compromising adjustment than today's problems are already past history and we have got another today's problem.

So you seem to believe that we should try to anticipate and yet, that is what we did in 1976 and what we were trying to do in 1978, and what we are trying to do now is anticipate. There is this great generation and this is not just in the Americas, the United States, but around the world, backyard tinkerers, and basement tinkerers, that come up with things that we couldn't have dreamed of not just 20 years ago, but 20 minutes ago.

So in trying to anticipate that, we also come up short. So if we can't deal with today's problems and we can't anticipate them very well either, maybe we are kidding ourselves to think we can ever deal with them with the mechanism that this place is accustomed to, which is a piece of law.

Mr. **Weingarten**. That may be, and I certainly think that issue underlies some of the questions that I raised.

Mr. **Mazzoli**. Has OTA done anything in that or do you see anything which would be up your alley as far as some kind of a scrutiny of the question of just how effective would be something other than law? And perhaps to analyze what other nations do which have the same kind of entrepreneurial beliefs we have and the same reward for imagination and inventiveness that we seem to have here. And how they have dealt with it, if they haven't dealt with it in relying upon copyright law.

Mr. **Weingarten**. I would say that given the analytical approach of OTA, the types of questions we address are questions of technological trends and, industry trends. We also are trying to understand in a number of our studies the issue I raised about the nature of the information marketplace. What is information like as a commodity? And how do firms behave?

Mr. **Mazzoli**. I asked this question yesterday and I am not sure whether OTA has addressed it or even could. We are commonly faced with the dilemma and that is that if we curtail the ability of the creative community to be protected, then we stifle their ambition, stifle creativity, and the end product hurts the country and the world. So we have to continue to protect these people.

Yet, one of our witnesses yesterday said that there is a need to spread information around the world in order to solve the food problems, and the social distress, and the political distress, and everything else, and if you seclude this information, sequester it, permit only a few to enter the inner sanctum, you are hurting the world. So I posed the question to him which he couldn't really deal with then: Has there been any quantification of the pros and cons, pluses and minuses, advantages and disadvantages, of the advantage to the world in having access to information freely as against the detriment to the creators of that information?

Has OTA dealt with that, or could it?

Mr. **Weingarten**. No; we have not dealt with it. We have raised it on occasion as an important issue.

Mr. **Mazzoli**. Well, if it can be raised within your group, it would be very helpful for us because we do not want to lose the creative juices. They have been very important to us and to the world.

But perhaps there is another way to continue those juices flowing and yet to also guarantee, as the witness said yesterday, the information in common, where everybody has an access.

One last thing—and this is, again, maybe not in OTA's field—was posed yesterday. We do endeavor to protect the creator, and that is salutary. But in the final analysis, the creator of the information usually gets his or hers first and not that much of it.

What we really do with copyright is protect the middleman, the distributors, and all of these producers, but not the real creators.

Has OTA dealt with that at all in any fashion?

Mr. **Weingarten**. No, not that I know of.

Mr. **Mazzoli**. Thank you very much.

Thank you, Mr. Chairman.

Mr. **Kastenmeier**. The gentleman from Ohio, Mr. DeWine.

Mr. **DeWine**. Thank you, Mr. Chairman.

To follow up on some of the questions my friend from Kentucky has posed: Do you feel that the traditional copyright concept that we have been operating on for years in this country, does it itself have the validity today in the sense that we justify it as a society because of what my friend has said that it encourages creativity?

Does it really encourage the creativity, first of all? I can't tell by your answers so far what your opinion is.

Mr. **WEINGARTEN**. Actually, I hope you can't tell because I don't really have an answer to that. I raised that as a major issue—whether that is a principal incentive to innovation. I really don't have an answer to that, sir.

Mr. **DEWINE**. I know we always have a lot of these central questions but isn't that certainly one of these central questions that has to be resolved as we move from the traditional concepts of copyright into new fields that we are applying the old premise of—Don't we have to know to make a decision whether that premise is really, in fact, true?

Everybody comes to my office and lobbies me about one of these issues, comes in with the idea, well, we have got to protect the creativity, and the artist or whoever is producing it, they just won't produce it unless they are protected. Our traditional concept has always been yes, that is correct.

If that is wrong, their premise is wrong, then certainly the reaction of Congress is going to be wrong, or it is going to be different.

Mr. **WEINGARTEN**. Yes; and I believe it is an open question at this time in this new technology. But it is also an important question, as I say, because even these backyard inventors and bright individuals may be at the forefront of our economic growth at this time. So, that is a key question, whether this framework of law for intellectual property protection encourages their work.

Mr. **DEWINE**. You just don't have an opinion.

Mr. **WEINGARTEN**. We don't. I mean, we have collections of letters and opinions from them and we have not evaluated them.

Mr. **DEWINE**. Well, moving on then, also to a very general question. You indicated in the latter part of your oral testimony that, at least what I wrote down here—that technology is outpacing legislation.

What is the solution to that? It would seem just to draw out one example, one solution is to pass such general laws that the courts end up being the ones who really legislate. The courts being the ones that really decide case by case by case, but not only case by case, they really make the law.

For those of us who don't like that concept, it causes more trouble for me; but is that one of the possible solutions?

You have indicated we really can't anticipate what is going to happen. So if we can't do that, how do we craft our laws? What is the suggestion you have?

Mr. **WEINGARTEN**. Let me give you a two-part answer. In the first place, I don't know that we can't anticipate or at least do a better job trying to anticipate trends.

I think in some cases we can track, particularly in the 10-year, 15-year timeframe, how things are moving and what the problems might be. That is a basic bias of my institution, I guess, more than anything else.

There are also other kinds of approaches. I think of the Communications Act of 1929 that really served reasonably well for many decades to see that the public interest was preserved as communications and broadcast technologies changed.

Now, after many years, we again have run into a point where the technology has outstripped the legislation. But, for many years the law seemed to work very well.

There are other approaches, I am sure. I don't have a catalog of them at this time.

Mr. **DeWine**. But it is one of the possibilities. The fear I have is that we write our laws so general that they have the flexibility to survive maybe for a minimum of 5 years that we really tell the courts that they are going to make the decisions.

Mr. **Weingarten**. Yes, sir. And, I, not being a lawyer, really don't have a feeling for this balance between general legislation and court interpretation or specific legislation that I know is an issue, an important issue.

Mr. **DeWine**. Thank you, Mr. Chairman.

Mr. **Kastenmeier**. The gentleman from Kansas.

Mr. **Glickman**. Yes. I would like to ask you whether you believe copyright laws can prevent change from happening just as a matter of fact? Can we structure our copyright laws to encourage or discourage things from happening in terms of change?

Mr. **Weingarten**. I addressed that question in a sense when I talked about the possibility of market distortion and copyright law as inadvertently favoring one technology over another.

To the more general question of whether the law could really inhibit technological change, I don't know the answer, certainly the law can inhibit the development of certain kinds of industries or certain kinds of services. You could make it illegal to rent computer programs or video tapes, or whatever, and in that sense affect an industry.

But whether or not that would inhibit or stimulate technological change, per se, I really don't know.

Mr. **Glickman**. Some futurists argued that change is beginning to happen so very rapidly. You know, we look like we are on the curve and we are going like this and pretty soon we are going to be going like this, and then it is going to turn right around and strangle us, and we will not be able to cope with it all.

I don't know if you are a futurist or not and whether you agree with that or not. Yesterday, one of the folks talked about the competing interests of the democracy of ideas which are, you know, getting the leash of copyright laws off our back in some respects it might help versus the chaos that may result if there is unbridled democracy of ideas being allowed.

I guess one of my questions is that the copyright laws may be able to in some way keep these two things in a relatively positive state of flux because if we got into an utter chaotic situation I think change would strangle us. It would be a real jungle out there.

I guess, again, when you deal with the issue of change in a generic way, can the copyright laws be used as a constructive tool of society to modify our control of change where we think it should be controlled as a matter of public policy.

Mr. **Weingarten**. I think intellectual property law, in general, has a potential for somehow acting as a referee in this conflict between public need for information and the need to preserve proprietary rights.

I don't know that I share—I may not be a futurist, maybe I am a semi-futurist for something, because I don't quite share this view of stampeding technology. I suggested in my testimony that it is rapid, that there is a vast smorgasbord of possibilities out there; that over the next decade we will be selecting or being offered as consumers. But, I don't buy the idea that we can't put our arms around that and understand it better, and somehow monitor the conflict.

I also have problems with this view of a total free flow of information because it seems to me that the marketplace itself tends to lock up information and make it an economic good. So it may be a free flow in a legal framework but it still would not necessarily be a free flow in the perspective of somebody sitting out there who needs access to a piece of information.

Mr. GLICKMAN. Thank you.

Thank you, Mr. Chairman.

Mr. KASTENMEIER. I just have a couple of questions.

You mentioned feasibility of protection. I was wondering whether one is to infer that if it isn't feasible to protect something, don't try to protect it.

Is that part of the conclusion?

Mr. WEINGARTEN. I think that is an aspect of that question that I was trying to raise, that in some sense one can end up with a law that resembles prohibition and ends up making criminals of everybody with access to a Xerox machine or a video cassette. That may not be in the national interest.

Mr. KASTENMEIER. We had a similar question in the sixties when we were in the revision process. There were copyright proprietors that wanted the right to do something, but the knowledge of it was not sufficient to extend protection. The teachers would do something else and you would have a bootleg situation. And rather than create a bootleg situation we would just not extend the protection. I think that was the answer we had tentatively come to as far as a particular process was concerned.

I was very interested in your suggesting that we are approaching or have approached a point where this technology increasingly will be international in character. And you may not have the answer to this but I will ask it anyway. That being the case, do we presently have institutions, either permanent or temporary, to deal with that? For example, there is a world intellectual property organization, and there may be other organizations, permanent or temporary. Are they adequate to deal with this; or do we need some sort of special new commission or international study to deal with this problem?

Do you have any thoughts about whether current organizations are capable of responding to these questions?

Mr. WEINGARTEN. We are touching in the area that is commonly given the title transporter data flow, that is an area that is currently in great debate in Washington.

One of the observations made by most people involved with this is that we have too many organizations playing the game of trying to regulate or negotiate over the transfer of information; both organizations within the U.S. Government that have interests or policymaking authority and international organizations through which we negotiate.

So our problem may be a proliferation of these channels of negotiation rather than too few.

On the other hand, I, myself, have not noticed that the questions of intellectual property protection, copyright, and so on, have really played a prominent role in that debate and it is possible that they need to be taken into consideration along with issues like privacy, information as a commodity, and so on, that seem to be central to it.

Mr. **Kastenmeier**. Mr. DeWine asked, is it necessary to protect creativity? And Mr. Glickman asked the question, is it possible that statutory copyright protection smothers new technology, provides a bar or limits perhaps even the transactional costs of it in society.

Those are good questions. Yesterday, a similar question was raised by a witness; in fact, what is intellectual property? Today we are not clear. While the traditional author, composer, creator concepts still remain, alongside them we find that some creators are corporate entities that are not strictly individual any longer. There are perhaps machines themselves doing some of the creating.

So we don't really know what is intellectual property absolutely clearly, and that may be a problem. As far as the necessity to reward creativity, and the conventional wisdom is that we should, there are cases such as the one we will go into next week on protection of semiconductor chips. Despite the fact that these chips are unprotected, this industry has expanded as though the protection itself wasn't actually necessary for the industry to explode.

Now, that may not be an equitable or satisfactory situation, but it is an illustration, nonetheless, that an industry has not required protection in the past in order for it to move forward very rapidly in terms of development. Do you care to comment?

Mr. **Weingarten**. Yes, sir, I think that is an important question. A similar question is raised in my mind when I read articles or people tell me that computer programing is inhibited by lack of proper protection. And in the evening I go to the local program store to browse through their selection for my Apple at home, it in some sense doesn't seem to have inhibited the creativity and productivity for that industry.

But there may be effects that are deeper and more subtle. So I wouldn't want to draw the conclusion that the programing industry doesn't need protection. I wouldn't even suggest such a thing. But I think the question is important.

Mr. **Kastenmeier**. Thank you. One last question:

In your statement you said given the problems of feasibility of protection, we may need to develop new techniques to protect intellectual property that are more appropriate to the electronic technologies. While you have not purported to suggest all the answers, I wonder if you did have in mind any new techniques?

Mr. **Weingarten**. No, I didn't.

Mr. **Kastenmeier**. All right.

You have been very, very helpful and we appreciate your presentation today, Dr. Weingarten.

Mr. **Weingarten**. Thank you very much, Mr. Chairman.

THE
GEORGE
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Washington, D.C. 20052 / The National Law Center

FRIDAY, JULY 21, 1983 AT 10 AM

ROOM 2226 OF THE RAYBURN HOB

(202) 676-7229

STATEMENT OF PROFESSOR JOHN F. BANZHAF III BEFORE THE HOUSE JUDICIARY SUBCOMM. ON THE COURTS ON COPYRIGHT AND OTHER IMPLICATIONS OF NEW TECHNOLOGY

Mr. Chairman, and Members of the Subcommittee:

I am honored to be able to appear before the Subcommittee this morning to help it to consider and to assess the implications of new technology; both on the narrow issues of copyright law and data processing, and on the broader issues of how our governmental institutions can best stay abreast of and deal with emerging scientific and technological developments.

I will attempt to do this from what I believe to be a unique perspective: not as a representative of any particular interest group or point of view; not as a legal expert prepared to discuss the latest court decisions; but rather as one who first brought copyright protection to the computer field, and first alerted Congress to the need to consider data processing in its revision of the copyright law.

Since that time I have been involved as an unpaid attorney bringing public interest legal actions in a wide variety of areas such as deceptive advertising, vehicle safety, environmental protection, discrimination, the needs of the handicapped, and political corruption including the appointment of a Special Prosecutor to investigate the Watergate situation, and the successful suit to recover money unlawful received by former Vice President Spiro T. Agnew.

FOOTNOTES AND ATTACHMENTS TO BE PROVIDED SEPARATELY

Thus I come before you both as a strong and early proponent of providing copyright protection to the fields of data processing and other emerging technologies, but also as a public interest lawyer and consumer advocate wary of creating unnecessary monopolies, stifling creativity by individuals and small firms, and of excessive costs to the public.

My hope is that my experiences as a former scientist- and engineer-turned-lawyer with various technoligies may be of some benefit to this Subcommittee.

Twenty years ago the computer industry was in its infancy, but already a large and rapidly growing baby. There were over 20,000 large computers in operation at the time valued at over five billion dollars, and an estimated one billion dollars had already been spent on computer programs to operate them. Yet, strangely enough, there was virtually no legal protection available for these programs, and thus little incentive to develop general purpose programs or to share existing programs, except as a computer sales tool.

Why was this? The Copyright Office had a policy against recognizing copyright protection for programs, apparently based upon a lack of understanding of what they were and the various forms in which they existed. Technical people familiar with programs probably had no knowledge of the copyright law, and of its possible application to protect these newly emerging and very valuable forms of intellectual property. Even the lawyers who presumably representated entities in the computer industry did not know enough about the two fields -- computer programming and copyright law -- to put the two together and make a persuasive case for copyright protection.

So, by default, the task fell to me as a second-year law student at Columbia Law school. As part of a project to see if computer programs could be copyrighted, I wrote two programs -- one on paper and one on magnetic tape -- and brought them down to the Copyright Office seeking registation. After some discussion, including my explanation of what they were and how they worked, the Cpyright Office reversed its previous policy and on May 4, 1964 agreed for the first time to register and recognize copyrights on computer programs.

This was my first major exposure to the wide and probably growing gap between people knowledgeable about law, and those knowledgeable about science and technology: a gap which in another context was referred to by C.P. Snow as "The Two Cultures."

My next experience with this critical communications gap occurred shortly thereafter. My copyright law research had led me, of course, to realize that Congress was then considering a major revision of the statutory copyright law; the first major revision since almost the turn of the century. Yet in searching through all of the study committee records I found only three references to the possible impact of data processing on the copyright law, or of the possible need to amend the copyright law to deal with this major new development. And, Mr. Chairman, all of these references began by saying, "Well, I don't feel competent, because I don't understand these machines well enough," or "I don't understand this business either."

So, on June 17, 1965, virtually upon my graduation from law school, I appeared before another House Judiciary Subcommittee to testify "as the sole and very unofficial representative of the data processing community." I pointed out the need to amend the proposed copyright revision to accommodate data processing, and suggested an amendment. No one from the industry or elsewhere supported this proposal, nor did anyone from any other group oppose it.

As difficult as it may be to believe, this already major industry -- probably the fastest growing new industry at that time with clear implications for the future -- was totally ignored in considering copyright law revisions. I can only suggest that the reason, once again, was the inability of people in one field to know about and keep up with important developments in another -- a problem which is already growing more and more serious as scientific knowledge and even scientific disciplines multiply, and as the rate of technological development continues to accelerate.

What then can Congress do to deal with this problem, and to prevent such serious oversights from happening again? One answer might be to seek to recruit and retain more staff members with scientific and technical backgrounds. Such people might be better able than those without such backgrounds to determine which technologies would be affected by Congressional action, or would be most in need of it. They might also be better able to communicate with people in these fields, and to seek out their input when specialized information might be useful.

As a simple example of the latter problem, I can cite from my own experience the reapportionment area, where lawyers and legislators adopted a number of weighted voting schemes to deal with the "one man, one vote" Supreme Court mandate. None of the lawyers on either side of these issues apparently realized that there might be mathematical problems involved with these plans, nor that there existed a branch of mathematics -- called "game theory" -- designed to deal with it. And naturally the people who knew about the mathematics paid little attention to the problems of reapportionment. It was only the fact that I came across the problem doing research for another law review article, and was aware of the existence of this mathematical discipline, which resulted in their analysis and eventual ban.

Another far-reaching proposal for dealing with the problems of emerging technologies is to consider setting up a special committee in each House of Congress composed solely of legislators with scientific or technical backgrounds -- much as the Judiciary Committees are composed of legislators with legal backgrounds. As to which of these disciplines -- law or science -- is more important in dealing with these problems, I can only say that most scientists I know can read and understand a judicial opinion or a statute a lot better than most lawyers can read and understand a research report, an equation, or a statistical analysis.

In the longer run we will probably even have to even do more. Looking probably no later than the year 2000, I would suggest that we will need an entirely new science or discipline simply to keep track of developments in all of the others. Such a scientific discipline -- NEXIALISM: the science of joining in an orderly fashion the knowledge of one field of learning with that of other fields -- has already been proposed by Author A. E.. van Vogt. Unless some progress in this direction is made soon, none of us will be able to keep up with anything, and we may literally find ourselves drowning in our own data.

Returning to the field of copyright law, I would suggest that I see no logical, legal, or policy reason why computer chips should not be entitled to copyright protection. Indeed, I will go even further and join my colleague Professor Irving Kayton and predict that genetically engineered works -- i.e., spliced and recombinant DNA micro organisms created by molecular biologists and genetic engineers -- can also be protected under the new copyright law, just as cmputer programs were found to fit within the old law. Indeed, even further reaching applications, including long-chain polymer organic compounds, and organic data-processing devices, could enjoy copyright protection under the existing statute.

But this does not mean, of course, that Congress should not carefully examine and reevaluate the copyright statute in response to changing technological development. Although the protection may be upheld under the existing statute, this certainly doesn't mean that there will be the requisite certainty for financial planning, or the most appropriate scope of protection.

I recall that when I sought copyright protection for computer programs, the principal barrier was a turn-of-the-century case involving player piano rolls with holes in them. Although I have as much respect for precedent as the next lawyer, I could not see why copyright protection for computer programs recorded on magnetic tape should depend on whether a clever lawyer could adequately distinguish punched paper tape from magnetic recording tape.

In concluding, Mr. Chairman, I would like to say a word in favor of copyright protection. Although I was at one time a patent attorney, and although as an inventor I have several technical patents, I nevertheless always had a soft spot in my heart for copyright protection. Patents are probably more prestigious, and provide a broader scope of protection than copyrights, in the sense that no one may practice the subject matter of the patent even if they independently discover it. But patents are expensive and difficult to get, seem to be regularly struck down by the courts, and provide a very broad monopoly.

In contrast, copyrights are very easy and quick to obtain, tend to be sustained, and although providing a limited protection only against copying, they also provide a wide range of very effective enforcement mechanisms. In short, the tradeoff seems to be a good one -- the creator prevents others from copying his original work at very little expense, and is thereby encouraged not only to create but to share his creation. In turn, the public gains the use of the work at a cost which is kept reasonable by the threat that an exorbitant fee will encourage others to duplicate the work -- e.g. a computer program, a chip, etc. -- without copying from the copyright holder, and then make it available to the public for less.

Mr. Chairman, I have been asked to keep my formal presentation brief, and so I will. I would be delighted to try to respond to any questions or comments the Subcommittee might have.

Respectfully submitted,

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Mr. **Kastenmeier**. Our final witness today in this series of 2 day's of hearings is John F. Banzhaf III, professor of law at George Washington University.

Professor Banzhaf brings a unique perspective to our discussion of copyright and technological change. He was the first person to obtain copyright protection for a computer program. He has received professional training at both M.I.T. and Columbia Law School.

Professor Banzhaf, we are very happy to hear from you this morning. You actually have a brief statement so you may proceed from it, or as you otherwise please.

TESTIMONY OF JOHN F. BANZHAF III, PROFESSOR OF LAW, GEORGE WASHINGTON UNIVERSITY LAW SCHOOL

Mr. **Banzhaf**. Thank you very much, Mr. Chairman.

I am honored to be here this morning and with your permission, I will briefly summarize the statement which I have prepared and would hope to submit more formally later on with footnotes and attachments which I did not have a chance to prepare in time.

Mr. **Kastenmeier**. Your statement then will be received in full for the record and subsequently amended as you care to.

Mr. **Banzhaf**. Thank you, Mr. Chairman.

I do come before you today, I suppose, with a unique perspective in a sense, part of it historical, part of it as a public interest lawyer.

As you said, I am not here representing any particular group or any organization. I am not prepared to discuss the latest in court decisions with the committee, but rather to throw out some general ideas, I think, based upon my general background and experience.

I was, as you said, the first person to get a copyright on a computer program. I think I was also the first person to appear before your committee or a predecessor of this committee to first suggest the need to consider data processing with regard to the amendment of the copyright law in the sixties and seventies.

But since that time, my activities have taken an entirely different bent. I have become what is conventionally known in Washington as a public interest lawyer and I have been active in a wide variety of areas, everything from discrimination, environmental protection, discrimination in auto safety, and to a certain extent even political corruption, the Watergate special prosecutor application suit against Spiro Agnew.

So I come in with, I suppose, a dual perspective on the one hand, as someone trained in law and initially very, very supportive of copyrights and of copyright protection to new and emerging industries and technologies. On the other hand, with the perspective of a public interest person who is naturally somewhat wary about creating unnecessary monopolies or stifling competition, or inhibiting the free flow of information.

Mr. Chairman, I would like to begin with a little bit of a historical perspective which may touch on some of the questions which were asked before. If I can take us back about 20 years to the computer industry, it was at that time somewhat in its infancy, although already a rather large and rapidly growing baby. We had some 20,000 large frame computers at that time, about $5 billion invested, and supposedly an estimated $1 billion invested in software to run the computers at that time.

Yet, strangely enough, there was at that time, or seemed to be at that time, no legal protection whatsoever for these computer programs.

The question that might be raised and was raised earlier, I believe, is whether this in any way inhibited the production of the programs? It didn't in the sense that obviously people continued to produce computer programs. We have a much larger number of them today.

But I think that the lack of legal protection at that time did inhibit or at least did not provide the encouragement which might have been necessary. And to understand that we have to go back and look at the three major producers of computer programs at that time which would be the large manufacturers such as IBM; the individual large users who made programs for their own operations, large corporations. And then finally, the smaller, specialized so-called service bureaus which wrote programs or assisted in programing for others.

It seems to me that the latter two in the absence of legal protection had little incentive to develop programs. The company developing programs for itself, knowing that it could not market them elsewhere with adequate protection, presumably was not encouraged to develop a more general program and, rather, would develop a specific one for in-house use.

Similarly, these service bureaus, which, after all, produced and sold these as their means of making a livelihood, likewise, would not want to spread them widely by leasing or renting or sale, because they lack the legal protection which was available.

So, by and large, if we go back to the early 1960's, I think the record will show that most of the people producing programs were the large manufacturers. And they were doing so regardless of the lack of legal protection because these were important sales incentive for people to buy the programs.

Indeed, at that time there was a general phrase which I was aware of as an engineer and scientist and person who patented things, and that is that with regard to new development, Mr. Chairman, you had a choice: you patented them or you epoxied them, and that basically meant that you either were able to reach the very high standards and very expensive requirements of obtaining a U.S. patent, or lacking that you basically had to keep it secret and the standard way in the electronics field was you put so much epoxy on it that nobody could dig it out and find out what the circuit was.

I think that indicates, or is one indication, that were there some other kind of protection, some medium ground between patent and epoxy, there might have been more encouragement, more sharing, more widespread development.

So I raised the question why did this situation occur back in 1964? And it seemed to me that the answer was the Copyright Office had had a longstanding policy against registering copyrights on computer programs and that this, with all due respect, was largely based on their ignorance of this very different and new kind of intellectual property. They didn't understand what programs were, and I don't think many of them had ever seen one.

Similarly, the people in the field who certainly knew what programs were probably were unaware of the ramifications of copyright law. They saw it in terms of newspapers, and books, and perhaps musical compositions, but not something as new and different as a computer program.

Then, finally, the lawyers who represented these entities in the field presumably didn't have the knowledge in both these areas: copyright law and the technologies of computer programs to put the two of them together.

So, Mr. Chairman, by default it kind of fell to me, it was part of a project I did as a second year law student at Columbia Law School, I sat down and wrote two programs. I brought them down to the U.S. Copyright Office seeking registration and I recall very well going in there and meeting with the top people and literally showing them for the first time what a computer program looked like, demonstrating at least in printed form there was a lot of English in it, one could read it if not understand it. That it bore resemblances to other copyrightable material.

And in response to their questions I explained how one could append a copyright notice to it and so on. And to make a long story short, that was the birth of copyright protection for computer programs.

This was my first experience, I think, with this very wide gap, this communications gap, between people knowledge in one field, people knowledgeable in the other field; the one that C. P. Snow referred to in his book "The Two Cultures."

I wonder as we meet here today whether the same thing might be happening, whether we might be in your looking over the implications of copyright technology ignoring other new emerging industries which don't have the knowledge or the sophistication or the wherewithal to bring their interests and needs to your attention.

Mr. Chairman, this was reinforced for me very shortly after I got the copyright programs, naturally I was aware of the predecessor subcommittee's study of the need to update the copyright law which hadn't at that time been updated, I think, since 1909. So I looked very carefully through it for any references to the emerging needs of computers, data processing, and information handling. I found three of them. One read, "Well, I don't feel competent because I don't understand these machines well enough." And then his colleague responded, "I don't understand this business either."

So, again, as astounding as it might be in the mid-1960's, no one came forward, at least up until that time, to suggest one way or another that your copyright law would have to take into account the particular needs, or problems, or interests of data processing.

So I appeared in 1965, as I said, at the time a very sole representative of this industry to make a proposal; nobody supported it, nobody objected to it, nobody probably was aware of it.

I am happy to say that it was eventually adopted but it seems to me that this is another example of how these major problems—and the computer industry at that time was already a major industry by anybody's reckoning—can easily be overlooked and ignored even in the very, very widespread effort that this committee made, and I congratulate it for looking and trying to look into all of the problems of data processing. And, of course, before the bill was eventually passed you did look much more deeply into it.

As was suggested earlier, I think this problem will not only continue but will accelerate. There is no question that the rate of the development of scientific and technical knowledge is going to continue to increase, probably at least expedientially, things will happen faster and faster and faster.

There are a number of things that might be done about it. I can suggest a few, perhaps, that Congress might want to think about. One might be, and this meaning no disrespect to any of the current staff members on this committee or anywhere else, but Congress might wish to try to attract staff members of more people with scientific and technical backgrounds.

It seems to me that these people would be in a better position to reach out, be aware of these new technologies, new developments, to know what their needs might be, to communicate them with them in a language that is mutually understandable, and also to seek out their input when specialized information might be useful.

I have had quite a number of experiences, which I won't go into, where things were done and nobody even realized that there was a scientific or technical problem; that there might be some value in going to somebody with that expertise and seeking their input. People ran around in the reapportionment days doing all kinds of things, never realizing that there were serious mathematical problems involved.

The U.S. Congress, for many years, considered amending the electoral college laws, relying on the truism that the people in the small States were the beneficiary of the current system. In neither case was it realized that there was, indeed, a branch of technology mathematics called game theory which could provide analysis, which could provide background, which could some kind of help in assessing these kinds of situations.

Another suggestion I might make would be in terms of the committee structure of Congress itself. And in making this I certainly don't wish to deprecate the Office of Technology Assessment. I think it is a major step in the right direction, long overdue, and probably should be expanded.

But it seems to me that particularly if science and technology is going to continue to develop as rapidly as it does and the Congress must anticipate or at least deal with those problems, then it might be helpful to form a committee composed entirely of legislators who are also, or have at least, scientific and technical backgrounds very similar to the way the Judiciary Committee is composed of people with legal backgrounds.

There seems to be an assumption that somehow people with legal backgrounds are able to handle all kinds of problems. And someone with a legal background, indeed, who makes his living training new people to have legal backgrounds, I certainly think they are advantageous. But with all frankness, Mr. Chairman, it seems to me that most scientists and engineers can read legislation or a judicial opinion a lot better than most lawyers can read an equation or a statistical printout, or a scientific report.

Indeed, C. P. Snow once looked at this question—he also had a foot in both worlds, as it were, literary and scientific—and he was asked where the fault lay in terms of this communication gap that he felt. And he answered it like this, he said, "I think asking the question to an engineer or scientist have you ever read a play of Shakespeare's is equivalent to asking a nontechnical person if he is aware of and can explain the second law of thermodynamics.

And asking an engineer can he read is roughly the same as asking a literary person can you define momentum? I wonder how many people in the Congress, how many people even in this audience would know the second law of thermodynamics or could give even an adequate definition of momentum.

Another thing which occurred to me as we were discussing the problem this morning is there may be some way of applying a merging technological disciplines to the operation of Congress itself. If you think about it, the Congress today operates in a very, very similar manner to the way it operated a hundred or probably 200 years ago. In many cases, it is unable to anticipate or keep up with advancing technology because of the gaps in terms of the time it takes, or its ability to process and assess information.

One wonders whether people with backgrounds in systems analysis or operations research and data flow and data processing might be able to look at the ops of the Congress and see some way to either speed it up or make it more effective without, of course, resulting in the kinds of compromises that we wish to avoid.

In the long run, Mr. Chairman, looking at a question Mr. Glickman had raised before, what can we do in the long run? One very long range suggestion might be to say that we need a new science. We need a new science simply to keep up with and to assess what is going in other sciences. One of those, in fact, has been proposed, the author A. E. van Vogt has proposed a new science called Nexialism, the science of joining in an orderly fashion the knowledge of one field of learning to those others.

Probably by the year 2000, we may very well need such a science simply to keep from drowning in our own data.

Returning, if I can, to the question of copyright protection in new areas, I think that what is going on today is a good illustration of the Congress ability to anticipate and to provide protection. You probably didn't have it in mind in your most recent amendment of the copyright law.

But on this point I would join with my colleague from George Washington University in suggesting that the very wide-ranging language that you adopted in 1976 and currently in the copyright law could, under the existing language, provide protection for things like DNA recombinant genes splicing, even long-chain molecular organic molecules, and looking ahead 20 years, computers and data processing equipment composed solely of living organisms.

This is not to say, of course, that a periodic reexamination of these questions isn't important; I think it is. And I think the committee should be congratulated for looking at it at this point. Perhaps copyright protection, or existing copyright protection, laws might not be the best means of protecting these and other things that we might very well think of.

I also think it is very useful, Mr. Chairman, for the Congress to continuously look at these issues, because again from a historical perspective, the major case which stood in the way of copyright protection for computer programs in 1964 was a case in 1909 involving paper rolls, paper punched tapes to play player pianos.

Now, I am a lawyer and I have as much respect for precedent, I suppose, as anybody else, but it seemed a little bit ludicrous to me that the issue of whether or not we should provide copyright protection for computer programs in 1964 should depend on what the U.S. Supreme Court did back in 1909 with regard to player pianos and the rolls that played them.

Finally, Mr. Chairman, with regard to the questions which were asked before, I think Mr. Mazzoli raised this question: What is the trade-off? What is the possible trade-off; what are the advantages in terms of copyright protection?

And although, as I say, I come in with a public interest type bias, I always thought that computer protection was a great value, particularly compared with the area of patents. Patent is something which is very, very diffcult to get; there is a very high standard to attain it; it is very expensive; there is a great deal of litigation; they seem not to be sustained in the courts. So a great many things might not be subject to patent protection or once the protection is achieved, it does create a total monopoly for the life of the patent.

Those copyright protections seem to me are always a lot closer to the common man, the small inventor, the creator, the backyard originator, if you will. In many cases it is very, very easy to get. You don't have to apply somewhere, you put a copyright notice on it, and you have it.

The standards for it are very, very low in terms of meeting them so that many things that would not meet the high standard for a patent would meet the much lower or easier standard for a copyright.

Although the protection is somewhat less in terms of monopoly, that is both its strength and its weakness. There is a strength in the sense that the copyright law provides a large arsenal of weapons for the copyright holder against a potential infringer. But it seems to me also the very fact that someone can go out and practice the copyright without infringing it is one of its major advantages. The copyright allows and encourages the exchange and flow of information in technology simply because if the holder of it puts too high a price on it, someone else under copyright law is perfectly free to go out and do exactly the same thing so long as he does not copy from the original.

So, for example, if company A developed a computer chip to do a certain process and protects it under copyright, which I think is certainly appropriate and possible under the current law, and then charges too high a price for it or restricts its availability, anyone else is free to go out and develop a computer chip to do exactly the same thing provided only that he does not copy from the person who originally made it.

So in my mind that is the beauty of the copyright law. I think it holds an important place not just with regard to traditional areas of authorship such as writings and written data but also in the emerging technologies which I discussed.

If I have seemed a little bit critical of Congress in this discussion, I certainly don't mean to be and I would be the first to say that an equal amount of fault or blame should fall on the other side: the public interest community, so-called.

I think many of the public interest lawyers and organizations have been deficient in terms of recognizing the impact of new technology; in terms of coming before the Congress, or the courts, or the regulatory agencies, to present their point of view on it.

Perhaps one thing that might be done would be to arrange some kind of more formal interchange. Could the Congress, for example, prevail upon the OTA to present programs from time to time to so-called public interest lawyers, public interest representatives, and so on, so that they would be aware of this and then could respond to Congress from their unique kind of perspective?

In closing, Mr. Chairman, I am very delighted to find I don't have to present answers, only questions. I tried in this so far to present some answers, so perhaps I can also add a few questions that I think would be relevant.

One was to a certain extent anticipated by the former speaker. As I look at computer programs, computer chips, genetic splicing, organic computers, and many other things, it seems to me there is an overlap between copyright and patent protection in many areas, and interface and overlap. I think that should be explored to see where best the line can and should be drawn between the two.

Obviously, also taking into account trade secrets, unfair competition—by the way, also the doctrine of misappropriation, which is sometimes included under unfair competition, sometimes not.

With regard to the value of this information, I think that is a very important study but I would suggest, of course, it would have to take into account the function of time. Data today may be very valuable; data 2 days from now may not be.

Also, the fact that unlike most other forms of property, it is not a unitary good. If I have a certain amount of information and somehow it goes to you, I have the same data; I have the same information. Its value has been decreased somewhat; if it goes to five other people some other decrease. I think that would have to be looked into.

Also, there is a tremendous value of information even in knowing where it lies. It is very important to know that a piece of data or information lies in a certain report, or a certain document, or a certain information storage and retrieval system. Sometimes, rather than being to the detriment of the person who owns that data, it may, in fact, be to the advantage.

I would also suggest in light of the more recent Supreme Court decisions that in any examination of the impact of copyright on information, technology, and so on, you would have to give some attention to the impact of the constitutional protections under the first amendment and the constitutional protections of the right of privacy in any area where the Government attempts directly through legislation, indirectly through agencies like the FCC, or otherwise, to regulate information flow.

Then, finally, I think there was a very valuable suggestion made this morning. I would like to put it in a slightly different form. It may be appropriate for the Congress to require in copyright or patent or other legislation that there is some affirmative duty on the part of the holder of that protection to take reasonable steps to protect it, not just slap a copyright notice, throw it out into the world, and then rely on the courts and others to provide the protection. Scrambling and coding, the use of house names, nixies; all of these are available kinds of protection which a copyright holder, for example, might use to provide additional or backed-up protection for his copyright, and that might be particularly advantageous particularly in the international area.

I think those are all the answers I have to the questions I would like to pose. I would be happy to try to answer any of yours.

Mr. KASTENMEIER. Thank you, Mr. Banzhaf.

On the last point, were you suggesting we might incorporate the affirmative duty on the part of copyright holders to protect their copyrights into the copyright law?

Mr. BANZHAF. I think that might be something that might be looked into, particularly as you have different kinds of technology which make copying an awful lot easier. To reduce the burden on the court, the problems of proof, and so on, I would see no problem, for example, in requiring that any copyright work of which it is susceptible must contain hidden pieces of information, so that if it is copied it would be very easy to estabish that.

For many years, mapmakers, for example, have included, we are told, mythical towns or rivers that aren't quite there. Telephone books usually contain a couple of dozen names and phone numbers of people who don't exist so that if somebody were to come out with a new directory or a new map and claim I did it myself, it would be a very simple way of proving that they, in fact, did not.

I suggested the same kind of thing with regard to computer programs. It is relatively easy to write in these little nixies that nobody would ever find but if doing the same thing that my program did were to turn up somewhere, we might require that these be in it as a means of showing that the copyrighting occurred.

Another situation might be, for example, the current transmission by satellite of a lot of data including even movies. Today, anybody can go out and for several thousand dollars buy an antenna and an amplifier and have movies.

Now, maybe we ought to say that in addition to whatever protection we want from a legal point of view, if it is technologically feasible to protect that by scrambling or in coding or other mechanism, that the holder does have that obligation to do so. And that if the holder or user doesn't take whatever reasonable protections are available, we are going to deny them or give them some lesser form of legal protection.

Mr. KASTENMEIER. One thing I asked prior witnesses, was whether they thought we should try to anticipate change or respond to it as it occurs.

Mr. BANZHAF. I think, Mr. Chairman, that you would probably want to do both, and I think of necessity you would have to do both.

In 1976, you tried to anticipate, you wrote, I think it is section 102, a very, very broad definition of what could be copyright. But I doubt very much that you had in mind that what might fall within that definition might be a new DNA molecule.

Did you or did you not have that in mind? Presumably, you did not.

Now, at the moment that issue has been raised by me and by my colleague, Professor Caton, at George Washington Law School. I think it could be protected but I think it would be well worthwhile for the committee, perhaps, to go back and ask, well, did we intend that? Is it the best form of protection? Would patent protection perhaps be a better one? Or, considering the unique nature of the beast, if I may use that word, something in between; something perhaps tailored specifically to those kind of organic developments.

And, today, Mr. Chairman, I think that organic developments and organic technology are probably going to be at least one of the major ways of the future, taking the place of the hardware and software technology of today.

So I think in short, you have got to anticipate, you have got to try the best you can to anticipate it. But also I think to avoid the problems that I had with computer programs back in 1964, that you must reach out constantly and reevaluate, and make whatever adjustments seem to be necessary. I don't see any way to avoid it.

The only thing that I can suggest is better processes for reaching out and seeing these things earlier; better technological knowledge to deal with it in addition to the legal knowledge; and perhaps some means all over Congress of dealing with these problems more quickly, recognizing that if you respond to a problem today and it takes you 3 years to do so, the problem may have very well gone away or changed.

Mr. **Kastenmeier**. One last question I have is what role do you see the Federal courts playing in terms of the law and interpretation of statutes and technological change?

Mr. **Banzhaf**. I would have to say that, very much offhand, Mr. Chairman, that I don't see too much of a difference in terms of their roles immediately. I think, to a certain extent, their function has always been to interpret and, to a certain extent, update the statutes that Congress passes. I think, particularly with the one-House veto decision recently, Congress is going to be faced with the problem of either writing much more detailed statutes—and this doesn't mean, by the way, just crossing the t's and dotting the i's—I think it also means making a lot more of the policy choices that directly or indirectly, consciously or subconsciously, were pushed off on the courts or the agencies.

Mr. **Kastenmeier**. Yes.

Mr. **Banzhaf**. I think that courts will also have to begin getting some of the technical and scientific expertise, directly or indirectly, perhaps by formal advisers, amicus briefs, or whatever.

There may be some value in considering whether or not copyright issues, as they pertain to technical areas, might be funneled into the new court which is now handling most of the patent problems. At the moment, your patent problems are funneled through one court which is acquiring expertise and experience in these technical areas, but I think your copyright problems still would come up through your ordinary district courts and your ordinary courts of appeals.

I don't see the need to have this court handle, say, copyright infringement of a Bee Gees' music case or a book. But if we are talking about copyright protection for chips or molecules or information processing or satellite transmission, there may be some way to permit it or perhaps even encourage that kind of litigation to wind up before a court with expertise and experience, and want also which will not then fragment the law so that California will not have one law of data processing and New York have another, which would be a catastrophe.

Mr. **Kastenmeier**. Thank you.

The gentleman from Ohio, Mr. DeWine.

Mr. **DeWine**. Mr. Chairman, I don't have any questions.

Mr. **Kastenmeier**. The gentleman from Kentucky, Mr. Mazzoli.

Mr. **Mazzoli**. Thank you very much, Mr. Chairman.

Thank you, Professor.

As I said yesterday, I commend the chairman for calling these hearings. They are really very stimulating and have, as you very adequately say, pointed up a lot of questions—perhaps fewer answers—but still, the idea of the hearings is to have questions and cause us to have to think.

You were in the room, I noticed, when I asked the gentleman before you from the OTA some questions. Because his shop doesn't deal with it, maybe you could help me. I asked him the question which routinely Mr. Sawyer asks, and I ask in his absence. That is whether the marketplace can take care of most of the problems and obviate the need to try to have Congress always either catching up or looking so far down the road that perhaps, inadvertently, we stifle creativity in the effort to try to create a law. I wondered if you might help me a little bit on that.

Do you think it is possible to look to the marketplace and the simple forces of supply and demand and putting these little nixies, or whatever you call them, into programs and adding a mythical river or township or two to protect your own? Do you think something like that could work?

Mr. **Banzhaf**. The two would have to work together. I think the problem that the committee faces would be drawing the line between the two.

But I don't see quite the dichotomy between the two that your question suggests. The typical marketplace probably does very well in terms of protecting property that I have in the sense of having it in my shop. If somebody takes it from me, of course, under old common law or current law, the law steps in and protects me. The police will come and return my property to me. As we get to property which doesn't have those attributes—somebody can pick it up and run off with it—we either have to say it enjoys no protection and must rely solely on things like secrecy, epoxying if you will, or drastically restricting the availability, or we would have to extend the protection.

For example, with regard to computer programs or computer chips, if you provide no protection, it seems to me that the developers are going to rely on one of several factors. One would be simply novelty, that they are going to get it out and get their money and be done before anybody else can catch up. But that may encourage the fly-by-night, the quick and not very good solution to the problem.

The second would be that they simply would not make them available, or they would so drastically restrict the availability of these things that others who might be able to use them in their daily business, or might be able to take them and expand on them, make them better, improve them, would not be able to do so.

So by extending copyright protection, what you are saying is that we are going to encourage these things to be made widely available using marketplace mechanisms. And in the long run, the marketplace mechanism is, I think, the best control on the abuse.

As I say, if I have a computer chip or a computer program that does something which is desirable, I will sell it, lease it, or rent it. But if I restrict it to much or charge too much, under copyright, someone else can go out and, as long as they don't copy me, they can produce a chip or program to do exactly the same thing. In that way, my price, my ability to control or limit the market, to restrict the flow of knowledge and information, is very, very limited.

This does not occur with patents. Once you have that patent, no one else may do the same thing, even if he independently creates it.

Mr. **Mazzoli**. Doctor, the distinction you made toward the end of your statement was interesting. I hadn't seen it put in quite that term before. It was interesting. Help me a little bit. Let me back up just a bit, reviewing my lack of background on this subject.

For example, absent copyright laws, if I were to have a book, and somebody else printed that book, made profit from it—not just for their use but for profit—absent copyright law, has that person violated any law? Do I have any right of action against that person?

Mr. **Banzhaf**. That would be hard to say. There is a doctrine of misappropriation, but there are very, very few cases in the air, and I think the reason why is that we have always had a copyright. Even before we had a Federal statutory copyright, we have had, at least for books, the common law copyright. So I think that we have always assumed that someone who created a book, that book could not immediately run out and be copied.

My guess would be that, without such protection, you would very, very drastically affect the publishing industry, and perhaps dry it up. Why should I go to the trouble of getting, acquiring, editing, proofing, producing, typesetting a manuscript when, as soon as I get it out, somebody with a Xerox machine and a slightly better distribution system can completely undercut me? I would think it would have a very, very dramatic impact there.

I think the more interesting problems occur when we talk about subjects of copyright protection which are further from the norm, such as a book. But I think, to a large extent, the same would happen with many of the others.

Mr. **Mazzoli**. So, absent these copyright laws, I, as a creator of a piece of intellectual property, really have nothing to protect me if someone were to take that from me?

Mr. **Banzhaf**. You would have only, in my view, the common law copyright or the doctrine of misappropriation. I suspect what would happen is that, if Congress were to do that, the court would simply recreate and extend the doctrine of misappropriation and common law copyright to, in effect, create a new copyright law. But then you would have the problem that your colleague, Mr. DeWine, referred to, that the law be made by individual judges who do not have the opportunity to have the reflection that Congress does, the imput that Congress does, nor the same requirement the Congress does to reflect the public interest.

So I think it would be better for the Congress to face those problems and leave for the courts the filling in of the gaps and extending it where necessary before Congress can act. If you were to virtually eliminate it, I think the courts would simply have to step in, or you would have a total anarchy on your hands.

Mr. **Mazzoli**. Do you think it would be wise to sort of raise the white flag and say, "I surrender to technology"? Technology is going so fast and so far and blindingly changing the future that we simply cannot cope with it by law. So that everything up to now, we will kind of hang on to, we think we halfway understand it. Books and maybe even some kinds of films—even though there are all these dish antennas sitting around—but certainly for the future, for all of you backyard tinkerers are dreaming up now, you had better get your getting while it is good because there is not much else we can protect.

Therefore, we sort of draw the line and try to deal with what we can deal with and let the future handle itself through the application of common law interests or market forces or, as you mentioned, using secrecy and using closely held material, and just let it be that way. We found that we can't anticipate the future that well and we are always a little bit short and, if we deal with today's problem, it is already solved by the time we actually can put the law to the President's desk.

Mr. **Banzhaf**. I don't think this Congress or any other legislature can hold back progress. There was one legislature which once tried to define π to equal 3. It would make it a lot easier to compute, but, of course, all of those circles in the State didn't obey that dictum.

I think what you are suggesting is the problem that we ran into under the old copyright bill. The old copyright bill of 1909, as I recall, did attempt to list all of the things which would be subject to copyright protection, and then along came phonograph records, photographs, radio, television, video tapes, half a dozen other things. The situation which occurred is that either Congress was forced to respond, as I recall, in four or five different, very specific amendments to those, because they could not remain without some form of protection, or creative laywers jury rigged them in and argued, much as I did with computer programs, that they did fall within the statute even though they didn't seem to.

Also, I think as a policy reason that it would be very shortsighted and wrong to try to deny protection to new development, because the basic trade-off is that we provide certain forms of protection, and these do encourage the developments.

I think, rather, what I would suggest is trying to anticipate the developments to a certain extent and, in each case, providing and tailoring the scope of protection to the particular item itself. Congress did that with phonograph areas for many years, very specific limited protection, actually spelling out the cost.

Mr. **Mazzoli**. But, Professor, isn't that essentially what we have been trying to do, though, providing a look to the future with enough flexibility so that the courts and Congress can look back in, and aren't we always coming up short? Don't we have monstrous lawsuits and everything pending now, and screams of anguish coming up from—as I think one of the witnesses said yesterday—the dispossessed or the displaced, trying to say, "Look, you have to protect us now"?

We have been trying to do that, and we really have not been able to do it very successfully. I wonder if we have the capability to do it in the future any more successfully.

Mr. **Banzhaf**. I would suggest that you and your colleagues on this committee and on the Judiciary Committee have done a very good job in terms of the copyright law, in terms of anticipating a great many developments, providing a framework in which the court and the regulatory agency, the Copyright Office, can work, and, to a large extent, that these things have been able to be accommodated.

Drawing a contrast, if I can for a moment, with the area of computer crime. I don't think that there has been as much thought or as much development in terms of dealing with that consequence of technological development of computers as you have had in the copyright area. I think it is inevitable that the Congress will have to deal with new technological developments. There is no alternative—you must do it.

The questions that remain is how effectively will you do it and how much will you do here, and how much will you leave to the courts. For the reasons I suggested before, I think you are better off taking your best shot, doing your best anticipation, constantly looking back as this hearing is doing, and say, "Are we doing a good job? Should we have a particular protection for this and this?" Recognizing, of course, there will be occasional lawsuits. You have going to have that with the large number of lawyers anyway. They will litigate anything, no matter what you do. That is not the answer. Excepting that you will constantly have to look back.

Mr. **Mazzoli.** I thank you.

Thank you, Mr. Chairman.

Mr. **Kastenmeier.** Thank you, Mr. Banzhaf, for your appearance here this morning. It was very helpful.

Mr. **Banzhaf.** Thank you.

Mr. **Kastenmeier.** This concludes this morning's hearing.

Before we actually conclude, I would like to insert two written statements in the hearing record. The first is from a Washington attorney, Richard H. Stern, whose practice primarily concerns computers and software.

[The statement of Richard H. Stern follows:]

STATEMENT OF RICHARD H. STERN BEFORE THE HOUSE COMMITTEE ON THE JUDICIARY, SUBCOMMITTEE ON COURTS, CIVIL LIBERTIES AND THE ADMINISTRATION OF JUSTICE, JULY 20, 1983, HEARINGS ON IMPACT OF NEW TECHNOLOGY ON THE PATENT AND COPYRIGHT LAWS.

Introduction

It is most appropriate that the Subcommittee has decided to begin its intellectual property hearings in this Congress with a broad philosophical inquiry into the impact of new technologies on the patent and copyright systems. New technologies have increasingly challenged these legal systems. The challenge is all the more critical because of the new technologies' great importance to national productivity, our balance of payments, and industrial progress.

Problems with the patent and copyright systems have already been perceived in the case of a number of new technologies. In 1974 the Congress indicated its concern over such problems by creating the Commission on New Technological Uses of Copyright (CONTU), on a temporary basis (P.L. 93-573). Perhaps this Congress will find it advantageous to revive CONTU episodically, or on a longer term basis. In any event, it is clear that the challenges of new technologies to the patent and copyright systems have not come to an end. If anything, it is to be expected that these challenges will increase in intensity and volume.

There are several reasons why new technology places stress on the traditional patent and copyright systems. First, the new technologies are different from the traditional subject matter of patent and copyright law (sometimes generically called "intellectual property" law). The mere fact of their difference makes the new technologies and their products difficult to fit within the patent and copyright laws, and it makes them difficult to fit under the existing systems that the Congress has established for the administration of those laws. Second, the environment of the creation and use of the products of the new technologies is often quite different from that of the traditional subject matter of patent and copyright law. This often makes the mechanisms of existing patent and copyright law inappropriate to protect the new technology. For example, patent and copyright law may give too little protection to new technology in some respects and too much in others. A third factor contributing to stress on existing patent and copyright law involves the limits of the patent and copyright clause (Article I, Section 8, Clause 8 of the Constitution). It is not clear whether all the important aspects of the new technologies fit within the categories of *Writings* or *Discoveries*, as the patent and copyright clause uses those terms. It is also unclear whether the creators of new technology products are *Authors* or *Inventors* in the constitutional sense. Hence, there may be constitutional limitations on protecting new technology. It is to be anticipated that our policy makers will have to consider these issues again and again under the further impacts of still newer technologies.

It is to be hoped that these hearings will give direction to the specific legislation with which the Subcommittee will presently be concerned, and that they will provide a broader context in which to view the specific intellectual property problems posed by the various new technologies. In particular, these hearings afford an opportunity to address three recurrent conceptual problems in molding the existing patent and copyright systems to meet the needs of the emergent technologies. The first conceptual problem discussed below primarily concerns the third stress factor and the question of how far the Congress is free to go in protecting the products of new technology. The answers also involve the first two stress factors and possible ways to overcome the problems that they cause. The second conceptual problem discussed below concerns the first and second stress factors in greater depth and the question of whether in dealing with new technology the Congress should feel constrained to utilize only the traditional tool kit of patent and copyright law or should instead modify the old tools or devise new tools more appropriate to mending new business/economic malfunctions. The final problem discussed is how new technology differs from old technology, from a financial and economic standpoint; how that affects piracy; and how piracy impacts the equities and incentives of innovative entrepreneurs of new technology.

I. The Limits of Intellectual Property Law

What is intellectual property? What should be the subject matter of patent and copyright law? In the broadest sense, the answers are the same: anything that is the product of human creativity -- all the fruits of the activities of the human mind, whatever they are. But that is an incomplete view, both legally and philosophically. The answers, and probably the questions as well, are too sweeping and assume a government of unlimited powers. The proper question to ask is: What is Congress free to do in legislating as to these products of human creativity?

The Congress acts only under its enumerated powers -- specifically, in this context, under the patent and copyright clause and under the commerce clause (Article I, Section 8, Clauses 3 and 8). The patent and copyright clause authorizes the Congress to act in order to promote the progress of science and useful arts. That means that the Congress must give earnest consideration to whether its proposed legislative action will actually promote rather than hinder such progress. If the Congress feels that enactment of a law granting some kind of protection under the patent and copyright clause will, on balance, more retard such progress than promote it, then Congress should not (indeed, must not) pass the law. Again, the Congress should not pass a proposed intellectual property law if the law will merely create private fortunes without compensating benefits to the public in the form of progress. These are legal limitations on the exercise of legislative power.

The philosophical or moral counterpart of all this is that there should always be a quid pro quo to the public in return for the grant of exclusive rights under patents or copyrights — in return for what may be called "monopoly" grants. It is fair to grant such monopolies as against the public only when and if the public will ultimately benefit in the form of its enjoying as compensation technological or intellectual progress. That does not necessarily mean, of course, that someone should make a measurement in each specific instance on a patent-by-patent or copyright-by-copyright basis; but the Congress should legislate only on the basis of its judgment that, in the overall generality of cases that will occur, the compensating public benefit will probably take place. These principles apply to new and old technology alike.

A further legal limit on protection under the patent and copyright clause is its authorization to the Congress to legislate as to *Writings* by *Authors* or *Discoveries* by *Inventors*. This limitation has in the past conjured up a variety of real or imagined problems:

- Are paintings done by chimpanzees copyrightable?
- Music composed by computers?
- Are chimpanzees or computers *Authors*? Must *Authors* be human beings?
- What about copyrighting audio, visual, or audio-visual displays created by the interaction of a computer and a random event or that of a computer and a third party's actions?
- Are ephemeral and transitory computer displays copyrightable *Writings*?
- Are slight and uninventive but useful technological advances constitutionally protectable under a "petty patent" system?
- Are natural laws patentable or copyrightable? The formulas and equations of mathematics? Ideas, apart from their individual concrete expressions?

These problems inevitably raise the question of utilizing the commerce clause instead of the patent and copyright clause or as a supplement to it. Can the Congress avoid the limitations, if any, on protecting new technologies by resorting to a different enumerated power? Subject to an important qualification, the answer is affirmative. The qualification is that Congress *cannot* subvert the policy of the patent and copyright clause by instead using the commerce clause, although Congress probably *can* avoid all merely technical limitations of the patent and copyright clause.

Where one part of the Constitution imposes an important negative limitation on the legislative power, the limitation cannot be avoided simply by use of a different enumerated power. For example, Congress cannot, by invoking the commerce clause, create involuntary servitude in disregard of the Thirteenth Amendment. It cannot, by regulating commerce, suppress freedom of speech or religion. Thus, if there is a definite policy in the patent and copyright clause (or elsewhere in the Constitution) that the public's use of facts shall not be restricted, a copyright on news events cannot be justified by invoking the commerce clause. If the patent and copyright clause has an affirmative policy that previously known technology shall not be made the subject of a patent, then a patent on old technology cannot be sustained under the commerce clause. On the other hand, the mere fact (if it is one) that a transitory and ephemeral video display is not deemed a *Writing* would not make it unconstitutional to protect such displays under the commerce clause. The equation $e=mc^2$ is too abstract an idea to qualify for protection under the existing patent or copyright laws. But that would probably not keep the Congress from protecting its creator or discoverer under the commerce clause, whether or not the equation is a *Discovery* or *Writing*, provided that such protection would not hinder the advancement of science and technology. However, if granting protection to the creators or discoverers of such mathematical equations or natural laws *would* on balance hinder the progress of science or technology, then using the commerce clause could not justify protecting them and thereby controverting the policy of the patent and copyright clause.

That means that Congress can and should, *when appropriate*, grant socially needed and justifiable protection to creators of new technology by using the commerce clause as well as the patent and copyright clause. Such a "belt and suspenders" approach may both (1) save the constitutionality of otherwise constitutionally risky legislation, and (2) permit a unified congressional treatment of complex subject matter in a single regulatory scheme, rather than fragment it among two or three separate regulatory schemes respectively based on the patent, copyright, and commerce powers. The only legitimate *caveat* is that the basic policies of the patent and copyright systems should not be controverted.

To be sure, the objection may be made that combining legislative action under the commerce clause with legislative action under the patent and copyright clause may "sully" the purity of copyright law or patent law. A similar argument may be made against possible legislation that combines patent and copyright principles to devise an intermediate or hybrid form of protection for a new technology. But such arguments, if made, are not legal arguments, let alone restatements of recognized constitutional law. Nothing in the United States Constitution or common sense requires the Congress, when it decides to legislate for new technologies, to continue the rigid old patent and copyright patterns devised many years ago for machines and books. Similarly, nothing in the Constitution forbids Congress to protect utilitarian articles under and by amending the copyright laws. The division between copyrights for liberal arts and patents for technology or "useful arts" is a matter of statute, not constitutional law. (Indeed, Congress has long protected primarily utilitarian articles under the copyright laws, as in the case of navigational charts, fabric designs, lamp bases, stuffed toys, costume jewelry, and belt buckles). The Congress should therefore feel free to use any and all of its powers, singly or in combination, to deal with new technology in a way that will advance and encourage technological progress.

It may be that a technology-by-technology approach could tend to fragment intellectual property law into a set of intellectual property laws. But, in the first place, there now exists no "seamless web" of intellectual property law. There is a plant patent law, a design patent law, and a utility patent law. There is a federal trademark law, a partial federal unfair competition law (section 43(a)), somewhat different state unfair competition laws, and a host of state trade secret laws. And there is a set of overlapping and partly diverging federal copyright laws for literary works, sound recordings, transmissions of television signals, and computer programs. Each of these bodies of intellectual property law furnishes differing rights and remedies to the owner of the intellectual property concerned. In short, our intellectual property law is already somewhat fragmented, and the result has been acceptable to the parties concerned. Pragmatism has, to date, been more important to users of intellectual property than ideology has been.

Second, and even more important in the present context, it is too soon for the Congress to know how to devise a unitary intellectual property law that would adequately serve the public interest in the progress of all the new technologies. There is a time for synthesis and a time for piece-by-piece solutions to problems as they arise. The time for overall synthesis may come, if ever, only after much experience on a case-by-case basis with the various new technologies. To await that state of knowledge would therefore be to decide to do nothing for new technology for perhaps many, many years. To wait until an ideal unitary intellectual property system can be thought out, before acting at all, could debilitate America's ability to accumulate and direct the capital necessary for technological progress. If the Congress believes that the subject matter of a new technology calls for some kind of intellectual property protection, now is the time to devise it. Thus, it would be appropriate, for example, to devise separately (1) a chip layout law, (2) a computer software law, (3) a genetic engineering law, and so on, as the country's economic and social needs may dictate.

II. Need for New Forms of Intellectual Property Law

One of the characteristics of present patent and copyright law is an all or nothing, either-or approach to protecting intellectual property. One alternative, which we may call "Option 1," is that the court shall do all of the following:

- temporarily, preliminarily, and permanently enjoin the defendant from making, using, or distributing the product;
- require the defendant to account for and disgorge to the plaintiff all the profits that the defendant made from the infringement;
- require the defendant to pay the plaintiff compensation for lost sales, and pay any other damages caused plaintiff by defendant's infringement; and
- order the destruction of all of defendant's infringing products and the equipment that defendant used in making them.

The other alternative, which we may call "Option 2," is to deny any relief at all to the plaintiff. There are ordinarily no intermediate options, such as allowing the defendant to continue the infringement but only on condition that defendant pay plaintiff a reasonable royalty. Ordinarily, no distinctions are made between defendants who are innocent infringers and those who are deliberate infringers; both are enjoined and both must pay damages. The plaintiff or owner of intellectual property either gets everything or else nothing in the way of relief.

When forced to choose between these two polar extremes, courts often choose Option 2. The arsenal of remedies under Option 1 may seem so awesome that courts prefer to give the intellectual property owner nothing at all rather than let him have so much. This is unfortunate and unjust. A far better system would be one in which the intellectual property owner's remedies were tuned more finely to the needs of the situation. For example, some of the rights or remedies of present patent and copyright law are excessive and unnecessary when applied to computer software. At the same time, however, in some ways the remedies of patent and copyright law are insufficient for computer software. (The same poor "fit" may well be true for chip layouts or other new forms of technology.) Intermediate strategies of protection would permit tailoring the rights and remedies of intellectual property owners to fit the needs of the technology in question. Such strategies would make it possible to grant rights to intellectual property owners in areas where it might otherwise be feared that allowing them any protection would result in giving them excessive protection, because the only alternative to Option 2 perceived is Option 1.

For example, ordinary patent and copyright law deny protection to "ideas," because they are said to be the tools or currency of technological progress. Moreover, ordinary patent and copyright law do not recognize a right of "enhancement," that is, a right to use the subject matter of someone else's patent or copyright in order to make and market a greatly enhanced version of the first comer's product. Both principles are wrong, I believe, when applied to computer software. Under the first principle, algorithms for computer programs are considered ideas and are therefore denied all protection under patent and copyright law. Under the second principle, enhancements of computer programs cannot be made and sold without the consent of the owner of the rights in the unenhanced version of the computer program. That is presumably sound under conventional patent and copyright law for conventional technology. But would it not be better in the case of computer software to allow anyone who wanted to do so to use the new algorithm, but require that he compensate the creator of the algorithm? Moreover, would it not be better to permit anyone willing to do so to market a substantial enhancement of an existing computer program, but require that the enhancer compensate the creator of the original program for using it? Under such intermediate strategies of protection of intellectual property in new technologies, the public would gain by more rapid proliferation and use of advances in the new technology. At the same time, the creators of advances on which later comers have built would be rewarded and encouraged.

The rigid approach of traditional patent and copyright law to such questions illustrates the improvidence of the either-or, all or nothing method of applying rights and remedies to new technology. In adapting traditional patent and copyright law to new technologies, or in devising new legal systems for such intellectual property, the Congress should refuse to bind itself by the either-or approach of the existing patent and copyright laws. Instead, the Congress should attempt to tailor rights and remedies in new forms of intellectual property as discerningly (and tune them as finely) to the needs of the new subject matter as seems feasible. If creating a new right may seem excessive, the way to prevent that result and at the same time do justice to the claimants for creation of the new right may well be to cut back on some of the remedies traditionally allowable, or to make the new right subject to other new countervailing rights by the public or third parties.

III. Front End Costs

The new technologies typically have enormous front end costs. (For example, to design and develop a new semiconductor chip, along with its supporting computer software, may easily cost the innovating firm $50 million.) This pervasive characteristic significantly distinguishes the intellectual property problems of the new technologies from those of the past. The new technologies are also characterized by a learning curve whereby the early units of a product cost ten or twenty times their price a decade later (for example, as occurred in the case of the hand held calculator). Prices may decline 25 percent each year (for example, in the semiconductor integrated circuit field) or 28 percent with each doubling of the total number of units produced (again, in the semiconductor industry). In the case of computer software, later units have almost a negligible cost compared to the cost of copy 1.

Closely related to these characteristics of new technology are two other characteristics: copying the product is often easy and cheap; and the cost of the product, aside from the front end research and development costs, is quite low relative to its economic value. In the case of computer software, the cost of copying disks or ROMs (typical storage media for commercial distribution of computer software) is very small. Moreover, the cost of a disk or ROM, by itself, is negligible compared to the market value of the stored computer program; the ratio of the two factors is often 1:100.

These characteristics make the products of the new technologies particularly vulnerable to "piracy," by which I mean (in less perjorative words) unauthorized competitive duplication. This vulnerability was not so characteristic of earlier industries, in which the unit cost of the entire product marketed tended to remain relatively higher, perhaps because there was a great deal of costly labor and material in the product besides the new technology. (There is a proverb in the computer industry: "Iron is costly; silicon is cheap.") Thus, in speaking of earlier technology, Thomas Jefferson, in his famous letter to Isaac McPherson, said: "He who receives an idea from me receives instruction himself without lessening mine; as he who lights his taper at mine receives light without darkening mine." But that is only part of the picture. The front end cost of a taper is no greater than the long run cost. But the front end cost of a new chip is vastly greater than the cost of the millionth chip, and he who lights his manufacture of chip No. 1,000,000 from the taper of the one who paid for chip No. 1 has an enormous economic advantage over the latter. The same thing is true of other new technologies where copying is easy and cheap, and where later units are much cheaper to make than earlier units.

As a result, the lack of a legal remedy against unauthorized competitive duplication of the products of such new technology creates two major problems. One concerns equity. The other concerns reinvestment in further technology. Perhaps this can be illustrated by the hypothetical of a man who builds a bridge across a river where there was previously no means to cross it. Suppose everyone who wants to is now free to use the bridge without compensating the builder. First, it is inequitable. Second, it is unlikely that the builder of the bridge (or other persons like him) will find it prudent to invest labor and money in other such bridges.

The first point, therefore, is that it is unfair, in the ordinary everyday sense of that word, for a second comer to help himself to the product of the first comer's labor and investment. To be sure, there may be circumstances when such unfairness is outweighed by considerations of public benefit. It will be for the Congress to make that balancing when it considers whether to grant further intellectual property protection for the products of new technologies. But fairness is a consideration that the Congress may, and I believe should, take into account when devising new legislation.

The second point is that it is difficult to raise funds to pay for the research and development of a new product unless those responsible for committing the necessary funds believe that their investment will be recouped and increased. The high front end cost of the products of many forms of new technology, and the low unit cost of subsequent production, emphasize the significance of that principle. The high front end cost can often be recouped only by selling many units of the relatively lower cost products far down the learning curve. If the innovator cannot sell the latter, because of competitive piracy, capital can become unavailable for the next innovative product. To be sure, the public may secure a short run price benefit as a result of the pirate's price competition. But when the result is to choke off the flow of capital to the development of new technology, the public is the long run loser in the form of decreased technological progress, economic stagnation, and consequent lessened quality of life.

Therefore, in weighing the claims for and against the creation of new intellectual property rights in products of new technologies, the Congress will need to make a discerning balance of various public interest considerations. One of them is short run price effects. Two others that deserve consideration, however, are equity and the probable effect on availability of capital. Sensible new systems of intellectual property protection for new technologies will strike a balance. That balance should grant enough rights and remedies to creators of new technology to call forth a desired level of technological progress, but not so much that the public will have parted with far more than necessary to create the desired level of industrial progress, and also not so much as would hinder the technological advances of others and the industrial progress that their advances will cause.

Striking that kind of balance is difficult. But the task is one far more suited to the abilities of the Congress than to those of the courts. This is an area where Congress should take charge, lock the barn door before the horse is stolen (as the Chairman has already put it), and give business the certainty and confidence that it needs to continue financing progress in new technologies.

Conclusion

New technologies create new legal challenges. Congress has the power to meet these challenges, under the patent and copyright clause of the Constitution and under the commerce clause. Congress may use those powers singly or in combination, to promote material progress by encouraging technological innovation. In doing so, the Congress is free to combine different intellectual property concepts on a pragmatic basis. It should do what it feels will work, and should not feel limited merely to what worked 200 years ago for different technology.

Congress should eschew the either-or approach of traditional intellectual property law. Instead, Congress should carefully tailor rights and remedies to meet new needs. If the Congress is concerned about the consequences of recognizing new intellectual property rights, it should fine tune the kind and extent of relief it allows to owners of new forms of intellectual property rather than deny them any rights at all.

The high front end costs of new technologies, and the low costs of copying them, make them particularly vulnerable to piracy. This raises serious fairness and incentive questions, which may properly be balanced against possible short run price effects of condoning piracy. The Congress is particularly suited and able to strike such a balance.

Mr. KASTENMEIER. The second is by Edward M. Cramer, president of Broadcast Music, Inc.

[The statement of Edward M. Cramer follows:]

MEMORANDUM TO THE HOUSE SUB-COMMITTEE ON COURTS, CIVIL LIBERTIES AND THE ADMINISTRATION OF JUSTICE

Submitted by

Edward M. Cramer
President
Broadcast Music, Inc. (BMI)

July 14, 1983

More than five years has elapsed since the new copyright act was enacted; certainly adequate enough time to judge whether or not it fulfilled the hopes of those who pressed for its enactment.

Although I was one of its sponsors, I had grave doubts at the time as to whether the new act was really designed to meet the problems of the future as well as the present.

I expressed these doubts in an article written six years ago entitled "Some Observations on the Copyright Law of 1976: Not Everything is Beautiful" in COMM/ENT, a Journal of Communications and Entertainment Law, Vol. I, No. 1, November 1977. A copy of that article is attached.

It is not my purpose here to make general comments about the act except to note that it did produce a number of beneficial changes, such as the duration of copyright and the elimination of the dual Federal and State systems. I will limit my present observations, therefore, to one area in which the act is woefully deficient. Specifically, I refer to the question of the "new technology".

It was long argued that a new copyright law was well overdue because the old law failed to take into account and was not equipped to handle many technological changes, such as computer software, reprography, and satellite broadcasting, to name just a few. In fact, the reports of both the Senate and House Judiciary Committees contain language suggesting that this new technology was a major impetus behind the Copyright Revision Act. The very first paragraph of the Senate report on the Act states that "many significant developments in technology and communications have rendered (the present Copyright Law) clearly inadequate to the needs of the country today". The House report expands this idea further:

> ...Motion pictures and sound recordings had just made their appearance in 1909, and radio and television were still in the early stages of their development. During the past half-century a wide range of new techniques for capturing

> and communicating printed matter, visual images, and and recorded sounds have come into use, and the increasing use of information storage and retrieval devices, communications satellites, and laser technology promises even greater changes in the near future. The technical advances have generated new industries and new methods for the reproduction and dissemination of copyrighted works, and the business relations between authors and users have evolved new patterns.

The legislative history clearly shows that the technologies of the '80s were known and considered by those who drafted the new act, and yet I submit that the act provides no real answers to the problems raised by the use of these technologies.

For example, if Williams v. Wilkins, the leading case on reprography, were to be decided under the Copyright Act of 1976 instead of the old act, would the results be the same? I don't purport to know the answer, but I know it can't be found within the confines of the act itself. The same is true for the copyright status of information storage and retrieval devices, satellites, home video, audio taping, etc. All of these things were in existence during the '70s; most of them were mentioned in the legislative history, and yet there is no statutory scheme for dealing with the known problems they created, to say nothing of those problems which will arise out of areas of technology yet to be developed.

In other instances, the statute - though elaborate - was clearly inadequate. Cable, for instance, was certainly not a new development and was the subject of an elaborate statutory scheme. The implementation of the statute has now raised serious concern. I note in passing that, in my view, Section 111 is probably the worst piece of statutory drafting I have ever seen. By comparison, it makes some of the more complex IRS regulations look like "See Spot Run".

The deficiences of the current copyright act are the result of a combination of factors, including the fact that representatives of narrow interest groups were so concerned with their own constituency that they failed to view the act in its totality. As one of those who was instrumental in the revision, I share the blame, but it should be corrected. Unfortunately, what I now see happening is a repetition of what took place in the past - special interest groups again seeking their own narrow revisions. This counter-productive activity should be discouraged. I urge that there be convened a conference of representatives of creators and users - spanning all known and affected technologies - to attempt to work out, in a businesslike manner, practical solutions to practical problems. And, in my view, participation should be limited - to whatever degree is possible - to only those with a first-hand knowledge of the problems. (Lawyers, bureacrats and academics should, for the most part, be excluded.) The Betamax case, for example, is not an easy one to decide. The recent Supreme Court action clearly bears this out. Setting it down for additional legal argument may assist the Court in ultimately arriving at a decision for the specific case but it will not solve the basic problem. Home taping will not disappear, and affected copyright owners deserve to be compensated. A conference consisting of manufacturers of equipment and tape, together with representatives of creators, would probably do more to bring about an overall practical solution than any amount of additional legal arguments.

I am convinced that this committee is truly concerned with finding an equitable solution(s) to the problems arising out of the use of the not-so-new technology. I urge you to take the initiative in convening a meeting, or a series of meetings, where the issues can be explored informally and without a written record of the procedings.

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Some Observations on The Copyright Law of 1976:

Not Everything is Beautiful*

By EDWARD M. CRAMER

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The author gratefully wishes to acknowledge the assistance of Gary F. Roth, staff attorney for Broadcast Music, Inc., in the preparation of this article.

Introduction

LAST FALL, delegates representing authors and composers from all over the world attended the meeting of the Confederacion Internationale des Societies d'Auteurs et Compositeurs (CISAC) in Paris. It was an extraordinary week. It featured CISAC's 50th anniversary, the 125th anniversary of the French performing rights organization (the Societe des Auteurs, Compositeurs et Editeurs de Musique (SACEM)), and the 200th anniversary of the Societe des Belles Lettres. Sharing the spotlight during the week of meetings, deliberations and festivities was the constant discussion among the delegates of the proposed new copyright law in the United States.[1] It was particularly appropriate that, at the concluding session of the Congress, an announcement was made to the assembled delegates that the United States had at long last passed its Copyright Revision Act.[2] However, as the senior representative of the largest American performing rights organization, I felt compelled to publicly express some misgivings. The purpose of this commentary is to elaborate on those misgivings in the hope that we will not have to wait another 67 years before needed changes are made.[3]

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[1] The Copyright Act in effect at the time had been enacted by Congress in substantially its present form in 1909. 17 U.S.C. § 1 *et. seq.* (1970 & Supp.V 1975). For a history of the attempted revisions of this Act, *see* H. R. REP. No. 94-1476, 94th Cong., 2nd Sess. 47 (1976).

[2] The Copyright Revision Act of 1976, Pub. L. No. 94-553, 90 Stat. 2541 (to be codified in 17 U.S.C. § 101 *et. seq.*) [hereinafter cited as Copyright Revision Act]. This Act, however, with minor exceptions, does not become effective until January 1, 1978. 17 U.S.C. NOTE PREC. § 101.

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Some Beneficial Results of the Revision

Certainly, the two changes in the United States copyright law which should be applauded by everyone are the extension of term of copyright protection,[4] and the elimination of the dual system of federal and state copyright laws.[5]

Under prior law, copyright protection extended for twenty-eight years, with a similar renewal term.[6] The length of copyright is measured in the new law by the life of the author and fifty years.[7] This provision brings American law into conformity with the law in most other countries.[8] It is the provision that has deservedly received the most publicity, especially among writers and publishers of music.[9]

An even more important change is the elimination of the dual system of copyright protection. Under that system, there actually existed fifty-one copyright laws: a federal statutory copyright, and the common law copyright of each of the fifty states.[10] The new law, for most purposes, is one federal statute which will preempt all state copyright laws.[11] Publication,[12] which in most cases[13] marked the beginning of the copyright term, will no longer be the dividing line between statutory federal copyright on the one hand, and state common law copyright on the other hand.[14]

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[3] *See generally* Hochberger, *Copyright Law: Shape of Things to Come*, 21 N.Y.L.J. 1 (1977).

[4] Copyright Revision Act §§ 302-05.

[5] *Id.* § 301.

[6] 17 U.S.C. § 24 (1970 & Supp.V 1975).

[7] Copyright Revision Act § 302.

[8] In particular, it eliminates the major obstacle preventing the United States from joining the Berne Convention. Berne Convention for the Protection of Literary and Artistic Works, *signed* September 9, 1886, 12 De Martens, Noveau Recueil general de Traites (2 ser.) 173, *completed at Paris* May 4, 1896, 24 De Martens, Noveau Recueil general de Traites (2 ser.) 758, *revised at Berlin* November 13, 1908, 1 L.N.T.S. 217, *completed at Berne* March 20, 1914, 1 L.N.T.S. 243, *revised at Rome* June 2, 1928, 123 L.N.T.S. 233, *revised at Brussels* June 26, 1948, 331 U.N.T.S. 217, *revised at Stockholm* July 14, 1967, — U.N.T.S. —, and *revised at Paris* July 24, 1971, — U.N.T.S. —. The Paris text of the Berne Convention entered into force on July 10, 1974, in accordance with Article 28. A copy may be found in 2 M. Nimmer, Nimmer on Copyright, App. P, at 1033 (1975) [hereinafter cited as Nimmer]. For a discussion of the protections afforded by the Berne Convention under prior law, see Nimmer, *Implications of the Prospective Revisions of the Berne Convention and the United States Copyright Law*, 19 Stan. L.R. 499 (1967). For a more general treatment, *see* 1 Nimmer, § 65.64, at 265 (1975). The United States is not a signatory of the Berne Convention.

[9] Besides the obvious economic benefits to creators and their heirs that an increase in the statutory period of monopoly confers, the new duration of the copyright term eliminates the need for a renewal period, one of the most administratively burdensome provisions under prior law, and allows those works which by their nature take longer to make an impact on the public to bring long-awaited remuneration to their creators before falling into the public domain. See H.R. Rep. No. 94-1476, 94th Cong., 2nd Sess. 134 (1976).

[10] The system allowed each state to protect the rights of authors within its jurisdiction until publication. See 1 Nimmer, *supra* note 8, §§ 46-49 at 183-196 (1975).

The extension of copyright to life and fifty years, and the establishment of a uniform United States copyright law, are major achievements which are all welcomed. Nevertheless, there are problems elsewhere in the new law which are cause enough to subdue the ovation.

The Compulsory License

In 1909, the public felt it necessary to establish a mechanism for the compulsory licensing of musical compositions in order to prevent a monopoly in the piano-roll industry by a small number of manufacturing companies.[15] Under the statutory mechanism which Congress enacted,[16] once a copyright proprietor authorized a recording of his or her work, anyone could thereafter record that work by obtaining the statutorily prescribed compulsory license.[17] At the time, this procedure was recognized to be an exception to general copyright principles,[18] and it was to have been limited to those exceptional circumstances. Despite such a narrow historical justification, the new copyright law expands and extends the concept of compulsory licensing into questionable new areas.

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[11] Copyright Revision Act § 301. States may presently protect any rights that are not within the categories listed in the Copyright Act. Goldstein v. California, 412 U.S. 546 (1973). *Cf.* Sears Roebuck & Co. v. Stiffel Co., 376 U.S. 225 (1964); Compco. Corp. v. Day Brite Lighting, Inc., 376 U.S. 234 (1964) (federal patent law preemptive). It is interesting to note that the language of the Copyright Revision Act in its preemptive provision, § 301, applies to state rights which are "equivalent" to the rights enumerated in § 106 rather than those which are "in the nature" of such rights. *See* S. Rep. No. 94-95, 94th Cong., 1st Sess. 114-16. (1975).

[12] "Investive publication" which secures federal copyright protection is a concept apart from that in § 26 of the present Copyright Act, 17 U.S.C. § 26 (Supp.V 1975), which refers to publication as the earliest date when copies of the first authorized edition are placed on sale, sold, or publicly distributed. Such publication must be further distinguished from "divestive publication," which marks the end of state common law protection. The case law reaches inconsistent results when this concept is applied to the exploitation of a work other than by the distribution of printed copies. *Compare,* McIntyre v. Double A Music Corp., 166 F.Supp. 681 (S.D. Cal. 1958) (general distribution of records a publication of underlying arrangement) *with* Rosette v. Rainbow Record Mfg. Corp., 354 F.Supp. 1183 (S.D.N.Y. 1973) (no publication since record not a "copy" of underlying composition).

[13] Plastic works, drawings, works of art, photographs, photoplays, motion pictures, dramatic compositions, and lectures may be registered and deposited prior to publication. 17 U.S.C. § 12 (1970); Shilknet v. Musicraft Records, 131 F.2d 929 (2nd Cir. 1942), *cert. denied* 319 U.S. 742 (1943).

[14] The new law starts the term of copyright running at the creation of the work, not publication. Copyright Revision Act § 310(a). The concept of publication, which resulted in much litigation, *see, e.g.,* Capitol Records v. Mercury Records Corp., 221 F.2d 657 (2nd Cir. 1955), has, therefore, for the most part been eliminated.

[15] At the turn of the century vigorous competition existed in the growing piano-roll industry. It was alleged that some of the major manufacturers of player pianos, led by the Aeolian Company in New York, were attempting to gain control of the business to the detriment of the smaller manufacturers and inventors. The company originally tried to use the patent laws to control the manufacture of the piano rolls, but this was found to be impractical. It then turned to the copyright laws in order to acquire the exclusive right to perform copyrighted sheet music on its player pianos. However, an early federal case, Kennedy v. McTammany, 33 Fed. 584 (1888), held that the use of perforated

Section 118 of the new law allows public broadcasters to claim a compulsory license[19] for the use of certain music. The broadcasters

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strips in an organette did not constitute a copy of the underlying sheet music in violation of the copyright laws. Nonetheless, it was alleged that the Aeolian Company had still acquired from most of the major publishing companies the exclusive rights to perform their copyrighted music on its piano rolls in the hope that the holding in *McTammany* would not be followed with respect to player-pianos. In 1908, however, the Supreme Court decided the case of White-Smith Music Publishing Company v. Apollo Co., 209 U.S. 1 (1908), in which it held that a mechanical piano roll reproduction is not a "copy" of the musical composition so reproduced and consequently the rights which may be claimed by copyright did not extend to such reproductions. Copyright owners turned to Congress for help.

In considering the precursor to the mechanical licensing provision, Congress was faced with a difficult problem. If it legislatively reversed the result in *White-Smith Music*, it was alleged that the Aeolian contracts would give the company a virtual monopoly on the music used by player pianos, thus strangling the small manufacturers and inventors. On the other hand, failure to grant copyright protection to such a lucrative market would be a serious blow to authors and composers. Congress compromised with the mechanical licensing provision, Copyright Act of 1909, ch. 320, §§ 1, 64, 35 Stat. 1075, 1088 (current version at 17 U.S.C. § 1(e) (1970)), which allowed the copyright owner the right to control only the first mechanical reproduction of his work. For a discussion of the fears of the "Aeolian Octopus," *see Hearings on S. 6330 & H.R. 19853 (The Copyright Act of 1909), before the Committees on Patents of the Senate and House of Representatives of the 59th Congress, Conjointly*, 59th Cong., 1st Sess. 96, 110, 202, (1906) (Statements of G. Howlett Davis, Esq., John J. O'Connell, and Nathan Burkan, Esq.); *see also* SHAFTER, MUSICAL COPYRIGHT 331 (1939).

[16] Copyright Act of 1909, ch. 320, §§ 1, 64, 35 Stat. 1075, 1088 (current version at 17 U.S.C. § 1(e) (1970)).

[17] Under present law, after the copyright owner files an "intention to use" then and only then must the user pay that statutory royalty of $.02 per copy. 17 U.S.C. § 1(e) (1970). Although the wording of § 1(e) is unclear in this respect, it has been so interpreted by the courts. Norbay Music, Inc. v. King Records, Inc., 290 F.2d 617 (2nd Cir. 1961). To take advantage of the compulsory license provision, a notice of intention to become a licensee thereunder must be served on the copyright proprietor. 17 U.S.C. § 1(e) (1970).

[18] See note 15, *supra* & authorities cited therein.

[19] This compulsory license for public broadcasters was introduced as an amendment to S.1361 by Senator Charles Mathias, Jr., during the 93rd Congress. However, the amendment was not actively considered with the understanding that the issue would be fully studied by the 94th Congress. During 1975, the Subcommittee on Patents, Trademarks, and Copyrights of the Senate Judiciary Committee instituted proceedings to which they invited representatives of public broadcasters and copyright proprietors in the hopes of reaching agreements outside the copyright legislation. The Subcommittee reported that tentative conclusions on a number of issues had been reached in those negotiations.

supported the demand for their own compulsory license[20] upon the undefined possibility that they might either undergo difficulties in obtaining the rights to use music on their stations, or encounter obstacles in securing synchronization rights to musical works.[21] But BMI has dealt with all other classes of music users and none of them has found any of the insurmountable problems that public broadcasters insisted exist for them.[22] Moreover, negotiations held under the auspices of the Senate Subcommittee on Courts, Civil Liberties, and the Administration of Justice[23] showed that there were no significant problems either in the obtaining of the rights to use music, or in the mechanics of payment to writers or publishers. What the compulsory license for public broadcasters in fact may do is to deprive writers and publishers of reasonable compensation for the use of their music and afford those public broadcasters the luxury of avoiding negotiation.[24]

However, in view of the unresolved problems, the Committee on the Judiciary of the 94th Congress incorporated a compulsory licensing provision similar to the one proposed by Senator Mathias in S.22, although it still encouraged the parties to reach private agreements. S. Rep. No. 94-473, 94th Cong., 1st Sess. 100 (1975).

[20] The license only applies to published, non-dramatic musical works, and to published pictorial, graphic, and sculptural works. Copyright Revision Act § 118(b). In general, the license only applies to broadcasts by nonprofit institutions, including public agencies. *Id.* § 118(d). The license fee will usually be determined by negotiations between the parties in cooperation with the Copyright Royalty Tribunal. *Id.* § 118(b). However, the terms and the scope of the compulsory license may be changed by voluntary agreements negotiated between the parties. *Id.* § 118(b)(2).

[21] *See* H.R. Rep. No. 94-1476, 94th Cong., 2nd Sess. 117 (1976).

[22] In fact, while the compulsory licensing provision was under discussion in Congress, PBS offered to dispense with their lobbying efforts if the United States performing rights societies would accept a $300,000 negotiated rate for two years. BMI, which would have received about $90,000 a year from this sum, rejected the offer as far too little to properly compensate its 50,000 affiliates for the use of their music on public television stations, given BMI's administrative costs and its obligation to pay foreign performing rights societies for music used on foreign-based PBS shows, such as "Monty Python's Flying Circus" and "Upstairs, Downstairs." *See Hearings on H.R. 2223 (The Copyright Revision Act of 1976), before the Subcommittee on Courts, Civil Liberties and the Administration of Justice of the House Judiciary Committee of the 94th Congress*, 94th Cong., 1st Sess. 970-72 (1975) [hereinafter cited as *House Hearings*]. If PBS were willing to drop its demand for a compulsory license, which was allegedly based on its fears about obtaining musical rights, in return for the acceptance by the performing rights societies of its monetary offer, then one can only conclude that the "potential horrors" that formed the basis for the PBS compulsory license were founded more in money than in red tape.

[23] These negotiations were requested to be held by the Senate Copyright Subcommittee by personal solicitation from Senator McClellan and Counsel Thomas Brennan to BMI and other copyright owner representatives.

[24] The Revision Act does require copyright owners and public broadcasters to negotiate in good faith in cooperation with the Copyright Royalty Tribunal in order to reach agreement on reasonable royalty rates. Copyright Revision Act § 118(b). Moreover, any agreements voluntarily negotiated between copyright owners and public broadcasters will be given effect in lieu of any determination by the Tribunal. *Id.* § 118(b)(2).

Congress also extended the copyright owner's right to receive compensation for the use of his work into two other areas. Cable television stations, for the first time,[25] will be required to pay a fee when they retransmit works originally broadcast by radio and television.[26] Jukeboxes, which previously enjoyed a statutory exemption,[27] will now be required to obtain licenses for the music that they play.[28] However, both of these new rights are subject to the expanded compulsory licensing provision.[29]

However, past experience with public broadcasters demonstrates that such voluntary negotiations, if they occur at all, will ultimately be fruitless. It is feared that writers and publishers, will, in the end, receive their share of any performance royalties according to the Tribunal's rate, which, given the nature of any such arbitration body, and the diminishing returns caused by the Tribunal's administrative costs, will not begin to approach the reasonable compensation which fair negotiations would produce. For an extended discussion of the public broadcasting licensing process, see *House Hearings*, *supra* note 22, at 857-990.

[25] Copyright Revision Act § 111. Under prior law, CATV was not required to pay performance royalties due to the Supreme Court's decisions in Fortnightly Corp. v. United Artists Television, Inc. 392 U.S. 390 (1968), and Teleprompter Corp. v. Columbia Broadcasting Sys., Inc. 415 U.S. 394 (1974). *See generally* NIMMER, *supra* note 8, § 107.44, at 414.1-414.10 (1975); *see also* note 50 & accompanying text, *infra*.

[26] At least, this is the result that the law is supposed to reach. Unfortunately, § 111(b) of the Revision Act is a prime example of the incomprehensibility of important statutory language. Many copyright lawyers can explain what it is supposed to accomplish, but I have yet to meet one who can read the section and understand its language. It is reprinted here in its entirety for scholarly dissection:

> § 111. Limitations on exclusive rights: *Secondary Transmissions.*
>
> (a) . . .
>
> (b) Secondary Transmission of Primary Transmission to Controlled Group. — Notwithstanding the provisions of subsections (a) and (c), the secondary transmission to the public of a primary transmission embodying a performance or display of a work is actionable as an act of infringement under section 501, and is fully subject to the remedies provided by sections 502 through 506 and 509, if the primary transmission is not made for reception by the public at large but is controlled and limited to reception by particular members of the public: *Provided*, however, that such secondary transmission is not actionable as an act of infringement if—
>
> (1) the primary transmission is made by a broadcast station licensed by the Federal Communications Commission; and
>
> (2) the carriage of the signals comprising the secondary transmission is required under the rules, regulations, or authorizations of the Federal Communications Commission; and
>
> (3) the signal of the primary transmitter is not altered or changed in any way by the secondary transmitter.

The foregoing is not the only instance in the Revision Act where the draftsmen seemed to have sacrificed clarity for quick enactment.

[27] 17 U.S.C. § 1(e) (1970).

[28] Copyright Revision Act § 116.

[29] Copyright Revision Act § 115. The license only applies in the case of nondramatic musical works.

The extension of compulsory licensing is an erosion of the rights of the copyright owner. From a limited exception in 1909, compulsory licensing has grown to become a major factor in our copyright law. Even such champions of the Copyright Revision Act as Barbara Ringer, the Registrar of Copyrights, conceded that the expansion of compulsory licensing was not a desirable change.[30] Unfortunately, I can only see that concept creeping into other areas with the result of further diminishing what should be left to the copyright owners to decide for themselves.

The Fixed Rate

Closely related to the problem of compulsory licensing of previously recorded musical works is the concept of a fixed statutory rate for that license, which is contained in the mechanical licensing provision.[31] Unfortunately, for the past sixty-nine years, through both depression and inflation, this fee has remained unchanged. Although the new law does change the fee,[32] it still perpetuates the static concept of fixed rates. However, the new law goes beyond the old by extending the concept of a statutory rate to jukeboxes as well, at the rate of $8.00 for each jukebox per year.[33] The statute also fixes the fees to be paid by cable television operators, basing those fees on the percentages of their gross receipts.[34]

The concept of a fixed statutory fee for a compulsory license is not only antagonistic to the rights of the copyright owner,[35] but the likelihood is that with the passage of time the concept will be expanded, and probably unjustifiably, to cover new areas.

The Copyright Office

Another significant change, which also was added to the new law without a great deal of discussion, was the expansion of the role of the Copyright Office. Under the present law, the Copyright Office merely performs ministerial functions, such as recording assignments of copyright,[36] preparing copyright certificates[37] and maintaining a catalogue of copyrighted material.[38]

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[30] *See House Hearings, supra* note 22, at 976-77.

[31] 17 U.S.C. § 1(e) (1970). The section provides that one may obtain a compulsory license for musical compositions which have been previously recorded by the copyright owner by giving notice of intention to become a licensee thereunder and by paying the statutory rate of $.02 for each record manufactured.

[32] Copyright Revision Act § 115. The rate has been increased to the larger of $.0275 per recording or $0.005 per minute of playing time, and it applies to each record made and distributed, rather than manufactured. *Id.* § 115(c)(2).

[33] Copyright Revision Act § 116. The rate is subject to review and further revision by the Copyright Royalty Tribunal. *Id.* § 801(b).

[34] Copyright Revision Act § 111(d)(2)(B).

[35] *See* S. Rep. No. 94-473, 94th Cong., 1st Sess. 101 (1975).

Under the new law, however, the Copyright Office has been given responsibilities far beyond anything it has ever undertaken previously. For example, the Office will now send to Congress a judgmental report on whether the Revision Act's library reproduction provisions have forged a fair balance between creators and users.[39] It will suggest methods for affixing a copyright notice that will comply with the law.[40] And it will make threshold administrative determinations of whether a work contains uncopyrightable subject matter or whether a copyright claim is invalid.[41] This expansion of the Office's role has raised questions of whether the new law is constitutionally sound.[42] In fact, the Department of Justice sent an eleventh hour memorandum to President Ford urging that he veto the Revision Act because it violated the constitutional requirement of separation of powers by, among other things, housing the newly formed Copyright Royalty Tribunal in the Library of Congress and providing it with Copyright Office staff.[43]

Without commenting on this constitutional question, I certainly feel that a good deal can be said as a practical matter in opposition to the expanded role of the Copyright Office. For implicit in this expansion is a threat to the underlying interests of copyright owners. If questions on the validity of the administration of copyrights arise, they should be answered squarely by the courts, and not by the direct or indirect influence of the Copyright Office.

The New Technology

Leaving aside these general observations, I would like to turn now to some more specific problems with the new law. It was argued that a new copyright law was long overdue because the old law had failed to take into account and was not equipped to handle recent technological changes, such as computer software, reprography, and satellite broadcasting, to name just a few. In fact, the reports of both the Senate and House Judiciary Committees contain language suggesting that this new technology was a major impetus behind the Copyright Revision Act. The very first paragraph of the Senate report on the Act states that "many significant developments in technology and communications have rendered (the present Copyright Law) clearly inadequate to the needs of the country today."[44] The House report expands this idea further:

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[36] 17 U.S.C. § 30 (1970). This practice has been continued under the new law. Copyright Revision Act § 706.

[37] 17 U.S.C. § 31 (1970). The practice has been continued under the new law. Copyright Revision Act § 701.

[38] 17 U.S.C. § 13 (1970); 37 C.F.R. § 201.3 (1973). This practice has been continued under the new law. Copyright Revision Act § 704.

[39] Copyright Revision Act § 108(i).

[40] *Id.* § 401(c).

[41] *Id.* § 410(a).

[42] *See* Brylawski, *The Copyright Office: A Constitutional Confrontation*, 44 GEO. WASH. L. REV. 1 (1975).

[43] *See* VARIETY, Oct. 27, 1976, at 93; *also* RECORD WORLD, Jan. 15, 1977, at 45.

> . . . Motion pictures and sound recordings had just made their appearance in 1909, and radio and television were still in the early stages of their development. During the past half-century a wide range of new techniques for capturing and communicating printed matter, visual images, and recorded sounds have come into use, and the increasing use of information storage and retrieval devices, communications satellites, and laser technology promises even greater changes in the near future. The technical advances have generated new industries and new methods for the reproduction and dissemination of copyrighted works, and the business relations between authors and users have evolved new patterns.[45]

Yet, despite these justifiable and important concerns, when one actually looks at the long history of the new copyright law to see precisely how it handles them, it appears that Congress only decided to create the National Commission on New Technological Uses and Works (CONTU) in 1974.[46] This Commission must report to the President and Congress recommendations for future changes in the Copyright Act which will keep them abreast of the developments in technology.[47] The Commission rendered its preliminary report on October 8, 1976; it is required to submit another by December 31, 1977.[48] The Commission is also authorized to submit as many interim reports as it deems necessary,[49] although to my knowledge no such reports have been issued. BMI is the largest performing rights organization in the world, with over 30 thousand writers and 15 thousand publishers. In addition, it administers hundreds of thousands of works from abroad. It is the leader in establishing new technologies to handle the mass volume of copyright usages. Other countries have come to look upon our system as a model for their own. Yet, CONTU made no inquiry into our operation, and it was only at BMI's request that CONTU staff members visited our headquarters on March 11, 1977, and later granted BMI an appearance before it on March 31, 1977, to demonstrate how we function. So, with all the time that was available to draft the Copyright Revision Act, the final version still did not accomplish its stated objective of preparing for the technology of today, let alone the technology of tomorrow.

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[44] S. Rep. No. 94-473, 94th Cong., 1st Sess. 47 (1975).

[45] H. Rep. No. 94-1476, 94th Cong., 2nd Sess. 47 (1976).

[46] 17 U.S.C. § 201(a)(Supp.V 1975).

[47] *Id.* § 201(c).

[48] *Id.* § 206(a)&(b).

[49] *Id.* § 206(c).

What Ever Happened to George Aiken?

When faced with a difficult problem, it appears that the draftsmen of the new law preferred to avoid its resolution. I refer specifically to the situation created by the decision of the United States Supreme Court in *20th Century Music Co. v. Aiken.*[50] In that case, the Court was confronted with an infringement action against a restaurant owner who furnished music to his customers during business hours by tuning in his radio, augmented by four loudspeakers, to a local broadcast station. The local broadcaster was licensed to broadcast the music, but the restaurant owner was not. Nonetheless, the Court held that there was no infringement since the restaurant owner was not "performing" the music, but merely "receiving" it.[51] The Court based its decision on the functional analysis that it had developed earlier in the *Cable Television Cases*:[52] "Broadcasters perform; viewers do not perform."[53]

The decision in *Aiken* runs contrary to the one in its famous predecessor, *Buck v. Jewell-LaSalle Realty Co.*[54] In *Jewell-LaSalle*, the Court was presented with the certified question:

> Do the acts of a hotel proprietor, in making available to his guests, through the instrumentality of a radio receiving set and loudspeakers installed in his hotel and under his control for the entertainment of his guests, the hearing of a copyrighted musical composition which has been broadcast from a radio transmitting station, constitute a performance of such composition within the meaning of (the Copyright Act)?[55]

To this question the Court answered "Yes." It is difficult to reconcile

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[50] 422 U.S. 151 (1975).

[51] *Id.* at 162.

[52] Fortnightly Corp. v. United Artists Television Inc., 392 U.S. 390 (1968); Teleprompter Corp. v. Columbia Broadcasting Sys., Inc., 415 U.S. 394 (1974).

[53] 20th Century Music Co. v. Aiken, 422 U.S. 151, 161 (1975).

[54] 283 U.S. 191 (1931).

[55] *Id.* at 191.

Jewell-LaSalle, which holds that a hotel proprietor who makes broadcast music available to his guests through loudspeakers is "performing" the music, with *Aiken*, which holds that a restaurant owner who provides the same service is not. Nevertheless, the Supreme Court did not expressly overrule *Jewell-LaSalle*.[56] Mr. Justice Blackmun, in a concurring opinion in *Aiken*, expressed his discomfort with the decision, noting that ". . . the Court dances around *Jewell-LaSalle*, as indeed it must, for it is potent opposing precedent for the present case and stands stalwart against respondent Aiken's position. I think that we should be realistic and forthright and if *Jewell-LaSalle* is in the way, overrule it."[57]

Justice Blackmun also pointed out the need for Congressional action to clarify the result of the Court's decision in *Aiken:*

> Resolution of these difficult problems and the fashioning of a more modern statute are to be expected from the Congress. In any event, for now, the Court seems content to continue with its simplistic approach and to accompany it with a pragmatic reliance on the 'practical unenforceability' . . . of the copyright law against such persons as George Aiken.[58]

Similar sentiments were also voiced by the dissent.[59]

But despite this advice, when it came time for the draftsmen actually to resolve the problem, it appears that they decided to avoid it instead. Section 110(5) of the Revision Act, which supposedly deals with the *Aiken* situation, reads as follows:

> § 110. Limitations on exclusive rights: Exemption of certain performances and displays.
>
> Notwithstanding the provisions of section 106, the following are not infringements of copyright:
>
> . . . .
>
> (5) communication of a transmission embodying a performance or display of a work by the public reception of the transmission on a single receiving apparatus of a kind commonly used in private homes, unless —
>
> (A) a direct charge is made to see or hear the transmission; or
> (B) the transmission thus received is transmitted to the public.[60]

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[56] Twentieth Century Music Co. v. Aiken, 422 U.S. 151, 160 (1975).

[57] 422 U.S. at 167 (Blackmun, J., concurring).

[58] *Id.* at 166.

[59] *Id.* at 167. (Burger, C. J., with whom Douglas, J., joins, dissenting). Chief Justice Burger began his dissent by stating: "My primary purpose in writing is not merely to express disagreement with the Court but to underscore what has repeatedly been stated by others as to the need for legislative action."

[60] Copyright Revision Act § 110(5).

When they asked whether this section would change the result in *Aiken*, reporters received different answers from the counsel for the Senate Subcommittee, the counsel for the House Subcommittee, and the Registrar of Copyrights, all certainly distinguished authorities on the subject.[61]

Section 101 of the Revision Act, the definitional section, states that "(t)o 'transmit' a performance or display is to communicate it by any device or process whereby images or sounds are received beyond the place from which they are sent."[62] Arguably, playing broadcast music over the type of inter-room loudspeaker system which the Court addressed in *Jewell-LaSalle* (or for that matter, *Aiken*,) would constitute a further transmission of the music to the public, and so fall within § 110(5)(B).[63] However, in the Conference Report of September 19, 1976, which accompanied the final version of the Revision Act, the Conference Committee stated:

> With respect to section 110(5), the conference substitute conforms to the language in the Senate bill. It is the intent of the conferees that a small commercial establishment of the type involved in *Twentieth Century Music Corp. v. Aiken*, . . . which merely augmented a home-type receiver and which was not of sufficient size to justify, as a practical matter, a subscription to a commercial background music service, would be exempt. However, where the public communication was by means of something other than a home-type receiving apparatus, or where the establishment actually makes a further transmission to the public, the exemption would not apply.[64]

If ever language invited litigation, the foregoing is it. What is a "small commercial establishment?" Who can define a "home-type" receiver? Is a "practical matter" determined on anything other than a completely subjective basis?

Thus, section 110(5) of the new Copyright Act apparently leaves us with the same unpalatable result as existed under *Aiken*, trying to determine "as a practical matter" whether the device in question is merely an "augmented home-type receiver" which only "receives" broadcast music, or whether it is somehow "something else" which actually transmits to the public and so "performs" the music. And Mr. Justice Blackmun's suggestion[65] to Congress to clarify the copyright liability with respect to music emanating from a loudspeaker seems, in the final result, to have fallen on deaf ears.

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[61] Mr. Thomas Brennan, the counsel for the Senate Subcommittee of the Judiciary of the 93rd Congress, said that "the George Aikens of this world would be liable" under the provisions of the Revision Act. RECORD WORLD, July 5, 1975, at 3. Ms. Barbara Ringer, the Registrar of Copyrights, was quoted as saying: "My feeling is that (Aiken) would not be liable, although this case does fall into an unclear area." *Id.* The counsel for the House Subcommittee of the Judiciary of the 93rd Congress, Mr. Herbert Fuchs, made probably the most honest remark of all when he admitted that: "I just don't know." *Id.*

[62] Copyright Revision Act § 101.

[63] *See* H. R. REP. No. 94-1733, 94th Cong., 2nd Sess. 86-88 (1976).

[64] H. R. CON. REP. No. 94-1733, 94th Cong., 2nd Sess. 75 (1976).

The Not-So-Constructive Notice

Section 401 of the Revision Act requires that whenever a work is protected under the copyright law, "in the United States or elsewhere," a notice shall be placed on all publicly distributed copies.[66] The notice consists of a ©, the word "copyright," or the abbreviation "copr."; the year of the first publication of the work; and the name of the copyright owner.[67] Accepting the fact that some notice is desirable,[68] then why is it necessary to include the date? In fact, the Revision Act provides that the date may be omitted when a pictorial, graphic, or sculptural work is reproduced on greeting cards, stationery, jewelry, toys, or any useful article.[69] If the date is not required in these instances, why should it be required in the case of music?

The purpose of the date is supposedly to advise the public when the work was first published so as to compute when the work will enter the public domain. But under the new law, the date of publication is almost irrelevant, since the term of copyright is measured by the life of the author plus fifty years.[70] Even in the case of pseudonyms and works for hire, where the term is seventy-five years from the year of first publication, there exists an alternative term: one hundred years from the year of creation, whichever expires first.[71] Therefore, even in those cases the date of publication is not necessarily the determining factor of when the work will be available to the general public.

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[65] See note 57 & accompanying text, *supra*.

[66] Copyright Revision Act § 401(a).

[67] *Id.* § 401(b).

[68] Besides the obvious reason of informing a potential user of the existence of copyright protection, the type of notice described in the text is a prerequisite to protection under the Universal Copyright Convention (U.C.C.), *signed at Geneva* September 6, 1952, *entered into force* July 10, 1974, 25 U.S.T. 1341, T.I.A.S. 7868, — U.N.T.S. —. A copy of the Paris text may be found in 2 Nimmer, *supra* note 8, App. Q, at 1072 (1975). *See also* Bogsch, The Law of Copyright Under the Universal Convention, at 26 (1968). However, since it was the United States which insisted that the Convention include the notice provision, it would be circular to argue that the only reason for including the provision in the new law was to comply with the U.C.C.

[69] Copyright Revision Act § 401(b)(2).

[70] *Id.* § 302(a).

[71] *Id.* § 302(c).

Furthermore, the effect of an omission of notice from a work no longer automatically results in the loss of copyright, as was often the case under prior law.[72] Under the new law, if, for example, within five years of publication without notice, a work has been registered and thereafter a "reasonable effort" has been made to add appropriate notice of copyright, the copyright is not invalidated.[73] Moreover, section 406 liberalizes the rules when there are errors in the names or dates of notice.[74]

Considering the longer duration of the term of copyright,[75] and the right of the author to recapture protection for his work,[76] there may well be a great number of assignments made after the work is originally published. Nothing is said in the Revision Act as to the notice requirements in the event of an assignment.[77] It is hard to see how the original copyright notice can be of any value when the first copyright owner has assigned the work and there have been several intermediate assignments.

In view of the changes governing the duration of copyright and the liberalization of the statutory remedies in the event that notice of copyright is omitted from the work, it seems clear that the preferable approach would have been to eliminate the notice requirement altogether, or at least modify it so that the date would no longer be required as part of the copyright notice.

Economic Impact

What does the new copyright law mean in terms of dollars and cents for the average composer and publisher of music? Certainly, the extension of the term of copyright protection[78] is significant for them. And an equally meaningful economic advance is provided by the increase in the mechanical royalty rate from $0.02 per record manufactured to $0.0275 per record manufactured or $0.005 per minute, whichever is greater.[79] But there the advance falters. Most of the other changes in the law will result in only the most insignificant increase in the income of the average music writer or publisher, at least for the foreseeable future. Writers and publishers should be aware, therefore, that the new law is not the bonanza that wishful thinkers believe it to be.

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[72] *See* 1 NIMMER, *supra* note 8, § 82, at 302 (1975).

[73] Copyright Revision Act § 405(a).

[74] *Id.* § 406.

[75] *Id.* § 302. See note 7 & accompanying text, *supra*.

[76] Copyright Revision Act § 405.

[77] Present law allows for the assignment of copyrights by an instrument in writing. 17 U.S.C. § 28 (1970). However, such assignments must be recorded with the Copyright Office within a specified period or risk being held void as against a subsequent purchaser for valuable consideration and without notice whose assignment has been duly recorded. 17 U.S.C. § 30 (1970). For a general discussion of assignments and other transfers of copyright, *see* 2 NIMMER, *supra* note 8, §§ 119-130, at 509-505 (1975).

[78] Copyright Revision Act § 302(a).

Three aspects of the new law underscore the fact of its limited economic impact.

1. Jukeboxes, which long enjoyed a statutory exemption from performing rights fees,[80] are now required to pay.[81] The requirement reminds me of a scene from Neil Simon's play, *The Prisoner of Second Avenue*.[82] In that scene, members of a family gather together and each agrees to contribute "x" to assist an ailing brother until someone asks, "How much is 'x'?" In the case of jukeboxes, "x" is only $8.00 per jukebox per year, and this sum is to be divided among all those whose music is used on the jukeboxes.[83] In other words, the jukebox royalty will be divided among all the members of the three major United States performing rights societies, Broadcast Music, Inc. (BMI), the American Society of Composers, Authors, and Publishers (ASCAP), and SESAC, Inc., as well as among those writers and publishers not affiliated with any licensing society. It is estimated that the total amount collected from the jukeboxes will not exceed $4 million a year,[84] and this is before deducting the expenses of collection and distribution. Thus, the net gain to all American music writers and publishers, whose numbers will likely exceed fifty thousand, plus the tens of thousands of foreign composers and publishers, should be no more than $3 million a year.

2. Statutory liability is now imposed on the cable television industry for the retransmission of copyrighted material which originated on broadcast television.[85] This major change should result in additional income to copyright owners. However, the Congressional Committee estimated that the total revenues from the cable industry during the

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[79] *Id.* § 114. See note 32 & accompanying text, *supra*.

[80] 17 U.S.C. § 1(e) (1970). See note 27 & accompanying text, *supra*.

[81] Copyright Revision Act § 116. See note 28 & accompanying text, *supra*.

[82] N. SIMON, THE PRISONER OF SECOND AVENUE (Avon Books, New York, 1973).

[83] Copyright Revision Act § 116.

[84] This is computed on the basis of a statutory rate of $8.00 per year on 500,000 jukeboxes in use.

[85] Copyright Revision Act § 111. See note 19 & accompanying text, *supra*.

first few years would be in the neighborhood of $8.7 million a year.[86] This figure is for all copyrighted material used on cable, including films, specially-packaged television shows, news, sports events and music. There is no exact indication of what music's share will be, but initially it will not exceed $2 million a year. And this figure, too, is before overhead and expenses.

3. Under the new law, royalty fees may now be collected for the performance of a musical composition under non-commercial auspices, which includes public broadcasting.[87] Prior law limited such collections only to public performances of a musical composition "for profit."[88] However, the earlier law distinguished between music and drama, giving a copyright owner of the latter the exclusive right to perform the work publicly, regardless of whether or not "for profit."[89] Thus, for example, if a public broadcaster wanted to present a copyrighted dramatic work, permission of the copyright owner was required. But when the public broadcaster performed a piece of protected music, no such clearance was necessary. This glaring inequity has been corrected,[90] at least in part. Under the new law, the copyright owner has the exclusive right to perform his musical work publicly, whether or not "for profit."[91] However, public broadcasters may still take advantage of a compulsory license for the use of the copyrighted music,[92] a benefit which they do not have in the case of other protected works, such as dramas and motion pictures.[93] The gross income from these non-profit performances of published nondramatic musical works cannot be estimated with accuracy; but the figure will not be great. Non-commercial users cannot be expected to pay the same rates as commercial operations.[94]

Despite some significant changes, it seems clear that the new law will not result in substantial economic benefits for the majority of composers and music publishers. It is not likely that the changes in the Copyright Act will bring about more than a five per cent increase in total performing rights income.

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[86] H. R. REP. No. 94-1476, 94th Cong., 2nd Sess. 91 (1976).

[87] Copyright Revision Act § 111.

[88] 17 U.S.C. § 1(e) (1970).

[89] 17 U.S.C. § 1(d) (1970).

[90] *See* H. R. REP. No. 94-1476, 94th Cong., 2nd Sess. 62-63 (1976).

[91] Copyright Revision Act § 106(4).

[92] Copyright Revision Act § 118. See note 19 & accompanying text, *supra*.

[93] *Id.*

[94] See note 22 & accompanying text, *supra*.

Conclusion

Congressman Edward W. Pattison, a member of the House Copyright Subcommittee who played an instrumental role in securing the passage of the new Copyright Act, observed:

> There remain unanswered and unaddressed issues. No doubt defects will be discovered in this legislation as it becomes operative. I hope the Subcommittee (of the Judiciary) will address itself to these matters in the next and succeeding sessions of the Congress so that a major revision such as this one will never again be necessary.[95]

It is indisputable that, in the main, the Copyright Revision Act of 1976 has long been overdue and that its enactment is welcomed by all concerned. In any major piece of legislation, and certainly in any one which has been in the making for over twenty years, there will be areas which will be touched upon too lightly, areas which will be written too expansively, and areas which will be neglected altogether. But one has the right to expect that once Congress undertakes such a monumental task as the wholesale revision of an entire body of law it will carefully analyze the priorities, potential abuses, and ultimate long-range effects of each provision before it gives any new provision its imprimatur. Unfortunately, too often in the Copyright Revision Act of 1976 Congress failed to take into account those things which would have made their revision of the law balanced between the creators and users of copyrighted works. Equally to blame of course were the representatives of the creators and users themselves, who were concerned almost exclusively with their special interests and so failed to take an objective look at the Revision Act in its entirety.

Now that the smoke has settled and we have a new Copyright Act, perhaps all interested parties can examine it more impartially and make those corrections which will bring the law into conformity with all of our objectives. Then we can have a copyright law that is fair to both creators and users while at the same time being administratively manageable.

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[95] 122 CONGRESSIONAL RECORD E5244 (daily ed. Sept. 23, 1976) (remarks of Rep. Pattison).

Mr. KASTENMEIER. Both statements are well written, well reasoned, and I commend them to my colleagues.

I would also like to thank Mr. Stern and Mr. Cramer for taking the time to formulate their views on the broad issue of the impact of new technologies on copyright law. In this regard, I would encourage industry representatives, trade associations, attorneys, and others interested in the field to submit similar written statements to us. Hopefully, we will have more statements on these questions.

We may have yet another day of general hearings sometime after the August recess. I am not sure that we have completely heard all useful points of view on the issues before us.

In any event, with these thoughts in mind, I would like to thank our witnesses, who have appeared before us.

The committee stands adjourned.

[Whereupon, at 12:15 p.m., the subcommittee was adjourned.]

Additional Statements

NEW TECHNOLOGIES AND COPYRIGHT: ARTHUR J. LEVINE

Our President, the President of the United States, said "Our copyright laws urgently need revision. They are imperfect in definition, confused and inconsistent in expression, they omit provision for many articles which under modern productive processes are entitled to protection. They impose hardships upon the copyright proprietor which are not essential to the fair protection of the public. They are difficult for the courts to interpret and impossible for the Copyright Office to administer with any satisfaction to the public. A complete revision of them is essential."

That was said not by President Ford, prior to the 1976 amendment to the Copyright Act in the United States; that was said by President Theodore Roosevelt in December of 1905, prior to the 1909 Act. But as much as things change they remain the same, and President Ford could easily have said that before 1976. Think, since 1909, of the methods of creating and transmitting copyrighted material, which did not exist when our 1909 Copyright Act was passed. Photorecords, audio tapes, motion pictures, talking motion pictures, radio, television, and cable television computers, satellites, and lasers, photocopiers; and the list is endless and you've heard them discussed this morning.

What happens when the new technologies come along? The Director General of the Hungarian Bureau of Authors Rights suggests a series of steps that copyright owners face with new technologies. First a new way of using works emerges. Then there is neither a specific provision in the legislation nor a precedent in jurisprudence for the use. If the users can interpret the lack of a clear cut answer in copyright laws in a way which makes free use possible, they base their practice on that. The possibility of the new use is more and more widely exploited and the fight begins for the rights and interests of the copyright owners. At the last stage, the chances of the copyright owner are weak because the use has now become common and legislatures are reluctant to change well established practices by creating what they see as new rights for the copyright owner.

The tension in copyright exists because the problem of access to information and the means of providing access are now so great that the copyright owners and copyright laws are seen by some as unnecessary and troublesome road blocks to the utopian society.

But let it not be forgotten that the purpose of copyright is to promote the general welfare and culture of the society by providing adequate incentives for authors to create. At least in the US, the foundation of copyright rests on the belief that these individual incentives will be for the general good.

BROWN, RUDNICK, FREED & GESMER,
Boston, MA, July 28, 1983.

Representative ROBERT W. KASTENMEIER,
Subcommittee on Courts, Civil Liberties and Administration of Justice, Judiciary Committee, House of Representatives, Washington, DC.

DEAR REPRESENTATIVE KASTENMEIER: I write you in connection with your current hearings on copyright and technological change. Since I was unable to attend the hearings, I take the liberty of submitting some observations for your consideration. I trust that I am not unduly tardy.

The revolutionary technological developments that seem to be undermining copyright protection instead actually are dramatizing for the first time the realities of the inherent limitations of that protection. Those developments which happen to be in reprography generally, have made it remarkably inexpensive to copy most types of works of authorship, whether they are recorded on paper or magnetic media. The claimed halcyon days of copyright protection were characterized not by stronger laws, or more respect for them, but rather by copying technology that is primitive by today's standards.

Although copyright law purports to bar all copying without express or implied permission, as a practical matter, it never was feasible for copyright owners to apprehend closet copiers. They only could pursue persons whose unauthorized copying was open and notorious. That basic situation has not changed one bit.

The obvious significant development is the fact that there are many more closet copiers now than there were before the availability of xerography and means for replicating magnetic diskettes and other media.

What many people tend to ignore, however, is the important, related fact that the cash market for works of authorship has grown tremendously with the advent of microcomputers. The attractiveness of those devices is largely a function of the supply of recorded diskettes for software programs and data bases and suppliers of those items are rising to the occasion.

The brutal reality about copyright in the age of reprography is the fact that publishers of works of authorship, other than books thus far, cannot expect realistically to be compensated for every copy used. Instead, they must make individual publishing decisions based on the probably much smaller quantities of copies for which they can secure payment. In that regard copyright owners really can enforce their rights only against pirates.

No amount of tinkering with copyright law actually will enhance copyright protections now that reprographic technology has been unleashed. The only step that would restore the percentages of compensated copies to their former high levels would be the unthinkable measure of government control over the availability of copying devices.

Actually, the experience ever since the industrial revolution has been one of dynamic change throughout society, with constant, often severe, dislocations of persons with favorable economic situations. The reprographic revolution appears similarly to be affecting the interests of various types of publishers adversely. However, it has brought with it both many new publishers of novel types of works of authorship and substantial business in new types of machines.

Probably the most significant technological development really affecting copyright law itself is the phenomenon of downloading or downline loading. That entails the delivery of information to customers by the transmissions of streams of electronic impulses to them directly, rather than the transfer of tangible works of authorship produced by the publisher, such as magnetic diskettes particularly. This new method is growing rapidly in importance. In order to make the furnished information usable, the symbols that represent it have to be recorded by the recipient. In many cases, the impulses received are recorded directly in the internal memory of the recipient's computer, rather than on a diskette. That phenomenon of downloading introduces an incompatibility with the facet of current copyright law that contemplates only the dissemination of tangible works of authorship that can bear copyright notices.

It well might be that, to protect the interests of copyright owners in the face of downloading, the Copyright Act of 1976 should be amended at least to alter the manner in which copyright notices are to be applied, if not to eliminate the requirement to accord with the laws of other countries.

Just as the operation of computers, which are information processing machines, demonstrates that works of authorship are essentially devices for generating information signals to human, or machine, information processors, downloading now shows that the furnishing of copies of works of authorship is merely a means for delivery of information signals to information processors. The newer method is for the supplier to generate the signals at its site and transmit them over telecommunications lines directly to customers.

I trust that this discussion will contribute to the understanding of the members of your subcommittee of the impact of technological change on copyright. If you believe that I can be of any further assistance, by all means let me know.

Sincerely,

Roy N. Freed.

APPENDIXES

Appendix I

Materials From Congressional Copyright and Technology Symposium, Fort Lauderdale, FL, February 4-6, 1984

OUTLINE

Day I: Saturday, February 4, 1984

8:00-9:00 (Coral Springs—Plantation Room) Buffet Breakfast.

9:00-9:15 (Amphitheater) Opening of the Symposium—Senator Charles McC. Mathias and Representative Robert W. Kastenmeier.

9:15-9:20 (Amphitheater) Introductory remarks—Librarian of Congress Daniel J. Boorstin, Register of Copyrights David Ladd and Symposium Rapporteur Paul Goldstein, Stanford Law School.

9:20-10:00—Overview—"Electronic Technology for the Policy Maker," Haines Gaffner, president, LINK, Resources, Corp.

10:00-12:00 (Board Room 1, and Meeting Rooms D & E) [with coffee available during session] Applications: Present and future—Sessions will include equipment demonstrations and opportunities for hands-on use of a variety of equipment, systems and services representative of the following technologies:

Broadcast, Cable, and Satellite Transmission Systems: to demonstrate projected capabilities of broadcast, cable, and satellite technologies, including two-day interaction and satellite services.

Home Computers and Electronic Entertainment Centers: to demonstrate the future integration of computer and communications systems to provide capabilities to use copyright works in new ways.

4:00-7:00 (Board Room 1 and Meeting Rooms D & E) Applications. Continued.

Educational Technology: Application of interactive computer aided instruction, electronic libraries, and video technology to modern education.

Electronic Publishing: New Systems for specialized publication, videotext, teletext, viewdata, etc.

Optical Disks and Automated Libraries: Library of Congress System.

7:30-8:30 (Grand Ballroom C) Reception.

8:30 (Grand Ballroom D) Dinner—"The Long-Range Future Impact of Computer and Communications Technology on Society": Martin Greenberger, IBM Professor of Computer and Information Systems, UCLA. Author of numerous books on science policy including "Computers, Communications and The Public Interest."

Day II: Sunday, February 5, 1984

8:00-9:00 (Bonaventure A) Buffet Breakfast.

A series of panel discussions on the future impact of technology on intellectual property.

9:00-10:15 (Amphitheater) [with coffee available during session] Panel Discussion I: Information Processing in the Future.

Moderator: Joe B. Wyatt, Chancellor, Vanderbilt University.

Panelists:

Christopher Burns, Information Consultant.
Donald Devine, Chief Executive Officer, Trilog Inc.
E. C. McIrvine, Manager of Advanced Planning, XEROX Corp.
Frederick Weingarten, Office of Technology Assessment.

10:15-11:45 (Amphitheater) Panel Discussion II: Publishing, Libraries, and Education.

Moderator: Toni Carbo Bearman, Executive Director, National Commission on Libraries and Information Science.

Panelists:

Hon. Stephen Breyer, Judge, U.S. Court of Appeals for the First Circuit.
Karen Hunter, Planning Officer, Elsevier Science Publishers, B.V.
Joseph P. Lash, Author.
Jay Lucker, Director of Libraries, Massachusetts Institute of Technology.
Warren Spurlin, Deputy Superintendent, The School Board of Sarasota County, Sarasota, Florida.

3:30–5:00 (Amphitheater) Panel Discussion III: Mass Media Distribution: The Future.

Moderator: Professor Harvey Zuckman, Director of the Communications Law Institute, Columbus School of Law at the Catholic University of America.

Panelists:

Bryan L. Burns, Director of Broadcasting, Office of the Commissioner of Baseball.
Mel Harris, President, Paramount Video.
Gustave M. Hauser, Chairman and Chief Executive Officer, Hauser Communications.
William Lilley III, Vice President, Corporate Affairs, CBS, Inc.
Clyde Washburn, Chief Scientist, Earth Terminals, Inc.

5:00–6:30 (Amphitheater) Panel Discussion IV: Administration of Rights in Copyrighted Works in the New Technologies.

Moderator: Professor Paul Goldstein, Stanford University Law School, and member of Cowan, Liebowitz, and Latman.

Panelists:

Thomas C. Brennan, Chairman, Copyright Royalty Tribunal.
Harlan Cleveland, Director of the Hubert H. Humphrey Institute of Public Affairs, University of Minnesota.
Alexander Hoffman, Senior Vice President, Doubleday & Co.
Professor John Kernochan, Columbia University Law School.
John C. Taylor III, Chairman of the Carnegie Corporation and member of Paul, Weiss, Rifkind, Wharton & Garrison.
Goerge Willoughby, Vice President and General Counsel King Broadcasting.

6:30–7:00 (Amphitheater) Rapporteur's Summation: Professor Paul Goldstein, Stanford Law School.

7:30–8:30 (Atrium Area) Reception.

8:30 (Meeting Room A) Dinner—Trends, Developments, and Projections: Frederick Pohl, prize winning science fiction author and editor.

Day III: Monday, February 6, 1984

7:45–8:30 (Coral Springs—Plantation Room) Buffet Breakfast.

8:30–9:30—Transportation to IBM Facility.

9:30–11:30—Tour of IBM Facility. Emphasis on Computer Aided Design (CAD) and Computer Aided Manufacturing (CAM): Including the design and manufacture of products and graphics and the use of robotics in manufacturing. This installation is the IBM world training center for robotics and computer aided manufacturing. In addition, the manufacturing facility is one of the most highly automated plants in the world and it is the home of the IBM personal computer.

11:30–12:00—Transportation from IBM Facility to airport.

Congressional Copyright and Technology Symposium: Panelists

About the Panelists * * *

Paul Goldstein, symposium rapporteur, is a well-known scholar and educator in the field of intellectual property law. The author of the textbook, "Copyright, Patent, Trademark, and Related State Doctrines," he has taught at Stanford School of Law since 1972. After earning an A.B. at Brandeis University and an LL.B. at Columbia School of Law, he was on the faculty of the State University of New York at Buffalo. He is a member of the California and New York bars, the Copyright Society of the U.S.A., and is a former member of the Editorial Advisory Board of the "Patent, Trademark, and Copyright Journal."

Joe B. Wyatt, moderator, is Chancellor of Vanderbilt University. A scholar in mathematics and computer science, he taught at the University of Houston and was Senior Lecturer in Computer Science at Harvard University. He is the co-author of "Financial Planning Models for Colleges and Universities." He is a member of the

Advisory Committee for Information and Science and Technology of the National Science Foundation.

Christopher Burns, panelist, is a consultant and information specialist; he has worked with several major metropolitan newspapers, including the Washington Post, in the areas of automation and information technology. He is a member of the Proprietary Rights Committee of the IAA, the Information Industry Association.

Donald Devine, panelist, a founder of and Chief Executive Officer of Trilog, Inc., studied at the Case Institute of Technology and the University of Pennsylvania. He is a member of the Association of Data Processing Service Organizations and was section president in that group in 1983.

E.C. McIrvine, panelist, is Manager of Advanced Planning at the Xerox Corporation. He has had a 25-year career in industry as an applied physicist and R. & D. manager, working for companies such as General Atomic in San Diego, and Ford Motor Company in Dearborn, Michigan. A member of the governing Board of the American Institute of Physics, he earned a Ph.D. in theoretical physics from Cornell University in 1959.

Frederick Weingarten, panelist, Communications and Information Technologies Program Manager at the Office of Technology Assessment, directed a program for research on the impact of computers on society for the National Science Foundation in 1971. He also served on the White House Committee on the Right of Privacy, the State Department Committee on Transborder Dataflow, and the Privacy Commission. He earned a Ph.D. in mathematics from Oregon State University and was granted a doctoral fellowship at Lawrence Laboratories.

Toni Carbo Bearman, moderator, is Executive Director of the National Commission on Libraries and Information Science. After earning a Ph.D. in Management of Information Resources from Drexel University, she worked in London as a special consultant for the Institute of Electrical Engineers. She also worked as executive director for NFAIS, the National Society for Abstracting and Indexing Services. She is a member of the American Society for Information Sciences and received their Watson-Davis Award for 1983.

The Honorable Stephen Breyer, panelist, serves as a Judge for the U.S. Court of Appeals for the First Circuit. A graduate of Harvard Law School, he served as law clerk to Justice Goldberg on the United States Supreme Court. A professor of law at Harvard and at the J.F. Kennedy School of Government, he also served as assistant special prosecutor with the Watergate Special Prosecution Force. He served as special counsel to the U.S. Senate Judiciary Committee from 1974 to 1975 and afterwards as its chief counsel.

Karen Hunter, panelist, is Planning Officer at Elsevier Science Publishers in New York City. She earned M.A. degrees at Cornell, Syracuse University, and at Columbia University. Before coming to Elsevier, she worked at Baker & Taylor and at Cornell University Library. She is a member of the Association of American Publishers and is Chairman of the Innovations Committee of the International Group of Scientific, Technical, and Medical Publishers.

Joseph P. Lash, panelist, is an editor and writer; as a biographer, he chronicled the lives of Dag Hammarskjold, Felix Frankfurter, and Eleanor and Franklin Roosevelt. He won the Pulitzer prize for biography and the National Book Award, and the Francis Parkman prize in 1972; in 1976 he won the first Samuel E. Morison award. Among his books are "Eleanor and Franklin;" "Eleanor: The Years Alone," and "From the Diaries of Felix Frankfurter."

Jay Lucker, panelist, is Director of Libraries at the Massachusetts Institute of Technology. After graduating from Columbia University and New York University, he worked with the New York Public Library and then at Princeton University as librarian and educator.

Warren Spurlin, panelist, is Deputy Superintendent of Sarasota County Public Schools in Sarasota, Florida. He has completed 26 years of service in public education; most recently, he was Assistant Superintendent of Curriculum and Instruction. He has completed several degrees including a Ph.D. in education from Wayne University in Detroit, Michigan. Recently he participated in the NIE National Conference on Producer-Educator Perspective on Educational Software. He has written a policy statement on copyright in the schools and inaugurated a staff development program in this area which has drawn national attention.

Harvey Zuckman, moderator, teaches law at Catholic University Columbus School of law, where he serves as Director of the Institute of Communications Law. After working with the U.S. Department of Justice in the civil division, he taught at St. Louis University and served as an adjunct professor of communications law at American University. He was executive producer of the American Law Institute's television series on legal education from 1973 to 1974. He is co-author of the text, "Mass Communications Law."

Bryan L. Burns, panelist, is Director of Broadcasting in the Office of the Commissioner of Baseball in Washington, D.C. He worked with the Kansas City Royals in Public Relations and as Director of Marketing and Special Events. He holds a B.S. in communications.

Mel Harris, panelist, is President of Paramount Video, with world-wide responsibility for the programming, production, and distribution of pay TV, home video, and supplemental markets. He holds a position on the Board of Directors of several organizations, including USA Cable Network, CIC Video (for international programming), and UPI Pay TV, based in London. He came to Paramount in 1977; before that he was engaged in commercial broadcasting, both radio and television.

Gustave M. Hauser, panelist, Chairman and Chief Executive of Hauser Communications, has held various executive positions in the field of cable communications. He has served as a vice-president of General Telephone Electronics International, and of Western Union International. He was president of Warner Cable Corporation from 1973 to 1975 and chief executive officer of Warner Amex Cable Communications, Inc. Author of "A Guide to Doing Business in the European Common Market," he was director-at-large of the U.S. Overseas Private Investment Corporation from 1969 to 1977.

William Lilley III, panelist, is vice-president for Corporate Affairs of CBS, Inc. In 1981 he co-authored "New Technologies Affecting Broadcasting." Before coming to CBS, he worked as vice-president for government affairs of American Express Co., as minority staff director for the House Committee on the Budget, and as director of the Council on Wage and Price Stability. Before serving as deputy assistant secretary of HUD, he was professor of government at the University of Virginia and assistant professor of history at Yale.

Clyde Washburn, panelist, is Chief Scientist of Earth Terminals, Inc., a manufacturer of Satellite Telecommunication reception products which is based in Cincinatti Ohio. Serving his third term as an elected director of SPACE, the Society for Private and Commercial Earth Stations, he is also a Governor of the television viewing rights Superfund organized by SPACE. He has served as technical liaison to government agencies and satellite program suppliers. He also directed a project for the New York Bureau for Criminal Justices Services, the PASS project, organized to develop miniaturized personal security devices to enhance the personal security of the elderly and the disabled.

Alan Latman, moderator, is a professor of law at New York University and a member of Cowan, Liebowitz, and Latman. His text on copyright law, "Copyright for the Eighties," is a popular one; he has written many articles and chapters on copyright. Executive Director of the Copyright Society of the U.S.A. since 1976, he has also served as Director of the Walter J. Derenburg Program for Copyright and Trademark and as adviser to several UNESCO and WIPO councils. He has also served as a member of the Board of Governors of the New York Patent Law Association.

Thomas C. Brennan, panelist, is again Chairman of the Copyright Royalty Tribunal after serving as its first chairman at its inception in 1977 and since as a Commissioner. After earning the J.D. degree at Georgetown University, he served as Chief Counsel to the Subcommittee on Patents, Trademarks, and Copyright, U.S. Senate Committee on the Judiciary, during the time that new copyright legislation was developed. He is a member of the Board of Trustees of the Copyright Society, of the D.C. Bar Association; he serves as Chairman of the Committee on Patents in the ABA.

Harlan James Cleveland, panelist, is Director of the Hubert H. Humphrey Institute of Public Affairs at the University of Minnesota. The International flavor of his career as a public servant has encompassed several decades; he served as executive director of the economic section of the Allied Commission in Rome in 1944–46 and as director of the China Office in Shanghai in 1947–1948, and as U.S. Ambassador to NATO, 1965–1969. He has taught at Syracuse University, at Princeton, and at the LBJ School of Public Affairs at the University of Texas. Winner of numerous awards, including the Woodrow Wilson award at Princeton, he has also written several books on international affairs, management, and ethics.

Alexander Hoffman, panelist, is Senior Vice President at Doubleday & Co. After earning a B.A. in philosophy at Dartmouth and an MBA in marketing at the Amostuck School of Business Administration, he served with the Navy for some years. He has been Group Vice-President and a member of the Executive Committee of Doubleday since 1969. He was director of the Association of American Publishers in 1979 to 1980, and in 1979 was a member of the AAP delegation to the USSR and the

People's Republic of China. He is Chairman of the Board of Directors of the Direct Marketing Association and a member of the Board of the Copyright clearance Center and the International Freedom to Publish Committee.

John Kernochan, panelist, is a professor at Columbia University School of Law. He was executive director of the Council for Atomic Age Studies from 1956–1959 and a member of the President's Commission on the Status of Women from 1962-1963. He serves on the Board of Directors of Volunteer Lawyers for the Arts; he was chairman of the Board of Galaxy Music Corporation.

John C. Taylor III, panelist, is Chairman of the Carnegie Corporation and a member of the law firm of Paul, Weiss, Rifkind, Wharton & Garrison. He earned the LL.B. degree of Yale in 1950, where he was a member of Phi Beta Kappa and received the Order of the COIF. He is a member of the Association of the Bar of New York City and its committee on Copyright and Literary Property, and of the American Bar Association.

George Willoughby, panelist, is Vice-President for Corporate and Legal Affairs at KING Broadcasting Co., a major television and communications corporation in Seattle. A graduate of Stanford Law School, he practiced law in Seattle for 15 years before joining KING. He is a member of the Seattle King County Bar Association and other bar associations.

Frederick Pohl, speaker, has won numerous awards for his science fiction writings. He received the International Science fiction Achievement Award in 1966, 1967, 1968, and 1973, and the H.G. Wells award in 1975. He has also worked as an editor for publishing companies such as Popular Science, Galaxy Publishing Company, and Bantam Books. His books include "The Space Merchants," "The Case Against Tomorrow," Drunkard's Walk," and "Galaxy Reader." He has been a member of the Science Fiction Writers of America, the American Astro Nautical Society and the British Inter-Planetary Society. He has also served on the Council of the Authors Guild.

Summary of Rapporteur

(By Paul Goldstein, Professor of Law, Stanford Law School)

PROCEEDINGS OF CONGRESSIONAL COPYRIGHT AND TECHNOLOGY SYMPOSIUM, FEBRUARY 4–6, 1984, FORT LAUDERDALE, FL

In my role as Rapporteur, I have been asked to synthesize this weekend's proceedings, and to try to distill the important lessons learned. Although, obviously, I cannot reflect everything important that has been said here, I believe that I can, at the very least, describe three, central themes that have pervaded this Symposium and that have variously been touched on in the remarks of the speakers, in questions from the participants, and even in some of the technology exhibits. In the spirit of this symposium—which is to take a highly objective, policy-oriented look at copyright and the new technologies—I shall express these three themes not in terms of solutions, but rather in terms of options; not in terms of answers, but rather in terms of questions.

Haines Gaffner accurately capsulized the first two of these themes in his reference to the two polar concerns of policymakers in this area: software on the one hand, and transmission and access on the other.

Software. Should computer software, and allied subject matter, be protected by copyright? This simple question leads to some deeper issues: Do we need more investment in the production of computer software? If so, will copyright protection induce the correct level and direction of investment in software production? Will some other intellectual property be more efficient? More equitable? The importance of these questions is amplified by yesterday's demonstration of CDC's PLATO library—a library that, according to Jean Harris' presentation, consumed a one billion-dollar investment.

Transmission and access. The questions here concern rights and infringement, not only of new copyright subject matter, but also of more traditional copyright subject matter. To what extent should copyright subject matter be protected against new uses facilitated by computers and other new technologies? Note that it is characteristic of these uses that they will often be decentralized and undetectable. The problem created by such new uses were exemplified by at least two of yesterday's exhibits—the demonstration of home satellite antenna reception, and of the disencryption of Visicorp's programs by a competitor's program, named—with true gallows humor—"Copywrite."

I.

Should copyright protect computer software? The discussions this weekend have reduced this question into three sets of subsidiary questions:

A. Are market conditions in this field such that producers need some form of protection, or subsidy, to stimulate the desired level of investment? Jean Harris' figure—one billion dollars to assemble the PLATO library of programs—certainly suggests some form of protection is needed to enable investors in the position of CDC to recoup their investment, or that some form of direct subsidy—from government or private foundations—is needed to serve in place of private investment. It is suggestive, certainly, but not necessarily conclusive.

B. If it is concluded that producers do need protection, should that protection take the form of property rights, or will technical self-help—program encryption, for example—be more cost-effective? Martin Greenberger noted last evening that WORDSTAR—one of the most widely used programs—achieved its commercial success without resort to encryption. Further, the Visicorp example suggests the limits to self-help through encryption. And, even if encryption is found necessary to protect investment, and even if it did work effectivley, we might ask whether we want to encourage the development of forces that will devote fine minds, and much valuable time, to the production, and destruction, of ever more elaborate encryption safeguards—minds that might more productively be applied to the development of new, positive programs instead.

C. If all of this suggests that legal protection is desirable what form should that legal protection take? Is copyright the appropriate vehicle for protecting software? Copyright law's traditional design has evolved over centuries to meet quite different needs, and may not be appropriate to this subject matter. Copyright might, for example, offer more protection than is needed in some respects, and less than is needed, in others. Register of Copyrights, David Ladd, addressing a closely analogous issue, observed yesterday that, assuming some kind of protection is desirable, it may be necessary to look outside copyright when dealing with data bases. Do the costs and benefits of (i) taking the copyright route net out to be more or less favorable than the cost and benefits of (ii) adapting some other, existing intellectual property system to the protection of software, or (iii) adopting some entirely new system specifically designed to protect software? Earlier today, Congressman Smith raised some questions that pointed in this direction—asking whether it might make sense to break copyright down into more discrete subject matter-oriented vehicles.

II.

Let me turn to the second theme touched on in these proceedings—transmission, access, consumers, and the administration of rights in both traditional and new copyright subject matter. What have we learned here?

One thing we've learned is a new word: downloading. From the examples given, though, I think we have also learned that this word is just a new way of describing an old and central quandary in copyright law: What uses of copyrighted works should be proscribed and what uses should be permitted? Although some of yesterday's speakers expressed the assumption that copyright law protects only against the production of a work in tangible copies, the truth is that copyright has, for well over a century now, also protected against a wide range of nontangible uses, such as often occur in downloading: performance, distribution, and more recently, under the 1976 Act, display of copyrighted works.

Although this might seem a minor quibble over words, I believe that it illustrates a larger problem in the legislative process: the risk of being distracted by new jargon and the risk of thinking that these new terms express new phenomena that need to be treated on new principles. The larger, connected danger is that of false analogies. As Judge Breyer noted earlier today, the analogy that grips Congress' attention will be the one that controls it.

Put in this frame, the question of liability for downloading does, however, helpfully exemplify the main challenge that the new technologies pose to the administration of copyright: should we extend rights against uses, facilitated by new technologies, that are widely dispersed, decentralized and frequently undetectable—not only downloading, but also library and office photocopying and home videotaping and audiotaping? How do we manage copyright in a world in which everyone is his or her own publisher or producer, truncating the traditional patterns of distribution?

In an ideal system of property rights, painted by some participants in this Symposium, everyone who uses a copyrighted work will pay something for their use—be it an amount that reflects the information's cost to the producer, or its value to the user. Yet, from the very start, copyright law made no pretense that this ideal was attainable, efficiently or equitably. From the beginning it was assumed that many uses of copyrighted works would go uncompensated. The married woman who bought a copy of "Uncle Tom's Cabin" and, after reading it herself, shared it with her family and then with her friends, paid neither more nor less for this widely-used copy than the lonely bachelor who bought a copy and only read it himself.

What has changed is that the new technologies have dramatically escalated the degree to which copyright uses today may go undetected and uncompensated. Now that the new technologies have disabled market transactions in many contexts, the question arises whether these new uses should be free, or whether the basis should be laid for new forms of market transactions.

The question whether new rights should be created has quickly been overshadowed in our discussion by the question: How can the transaction costs of policing copyright uses be reduced to acceptable levels? Don Devine has referred to such relatively low-cost, and non-intrusive compensatory schemes as volume discounts to major centralized users. Another suggestion was dual pricing under which libraries and other centralized users would pay one—presumably higher—price while individual users paid a lower price for the same work. Another possibility, noted by Mel Harris, is simply self-policing among individual users.

Should new institutions be erected to police new rights? One caution, pointed out by more than one Congressman at this Symposium, is that we must be careful to avoid enacting laws that cannot be enforced, for the result will be disrespect for the law generally. A closely related point is that we must do what we can to educate the public as to the purposes of copyright law, generally.

If new laws and institutions should be created, should they be aimed at simulating market results or should they be aimed at some other object? Should they be run by government agencies, of the sort described by Chairman Brennan of the Copyright Royalty Tribunal, or by private organizations, like ASCAP, and BMI, as described by John Taylor and John Kernochan? Or should they folllw the pattern of the Copyright Clearance Center, as described by Alexander Hoffman? And, if these institutions are to operate in the private sector, should they be regulated by antitrust decree or otherwise?

There has been some suggestion, that the problems that the new technologies have created, by proliferating decentralized uses, should not be allowed to obscure the potential ways in which these very same technologies—as data storage, computation and retrieval—can in fact be employed to enable every user to pay for what he or she uses, by maintaining, recording and calculating each use, be it photocopying, or borrowing from a library—or downloading, for that matter. Needless to say, though, the concern for protection of individual privacy, as expressed by Mr. Berman, is implicated here.

Although the problem of decentralized uses has occupied center stage in the discussion of rights—in the Congress, in judicial decisions, in public policy debates, and in our own discussions, too—I should note another aspect of the administration of rights, that was considered in this Symposium and that was well underscored by the remarks of Joseph Lash, John Taylor and John Kernochan: What are the implications of these new, technologically facilitated uses for the returns paid directly to the authors, composers, and artists who make the copyright engine run? In what ways can new technologies be harnessed to acheive the more equitable distribution of royalties to the creators of copyrighted works? Parenthetically, Joseph Lash's example of his photocopying activities in Columbia University's Russian collection should remind us that the questions of use and production are closely connected in copyright: To produce knowledge requires using information created by others. This knoweldge, once produced—and copyrighted—will in turn become a source of information for still others in their production of knowledge, and so on, in what is hoped to be a never-ending chain.

III.

Finally, I would like to touch on a third theme that, although not expressly addressed in these proceedings, underlies all that has been said and, indeed, represents the very reason for our being here: How can the House and Senate Subcommittees charged with responsibility in this area, and how can the Congress generally, best position themselves to monitor the new technologies and to adjust copyright, and possibly other intellectual properties, to maintain the needed balance between incentives to the production and consumption of new information?

If any one point has been made clear these past two days, it is that technology is advancing at a pace far greater than the capabilities of the national legislature to keep up with it. Congressman Kastenmeier poignantly reminded us in his introductory remarks that Congress, in passing the 1976 Copyright Act, perceived the need to temporize on some emerging, already problematic, technological issues in order to achieve final resolution of issues that had long been pressing from remedy. I was struck in this connection by Haines Gaffner's bromide respecting the new technologies; "When you are working on the cutting edge of technology, the main thing is to stay behind the blade." That applies at least doubly for Congressional efforts: "When you are legislating on the cutting edge of technology, the all-important thing is to stay behind the blade."

I say, "it applied doubly," because there are variables other than technology and the legislative process that are implicated here. Let me just identify four.

A. One is the crucial issue of timing. Earlier today, Senator Mathias noted the ever-present danger that, even while Congress is deliberating on these important issues, changing economic realities may very well entrench the new technologies, thus concluding the issue being deliberated, and precluding a principled result. Don Devine pointed out that personal computers will experience their greater growth in the next decade—a far shorter horizon, no doubt, than Congress can possibly contemplate in dealing with that growth.

B. Second, is the problem that economists refer to as distributional effects, and that Dr. Spurlin more graphically described as the possibility that public policy decisions in matters involving the new technologies can very well widen the gap between the have and the have-nots—or, as Clyde Washburn indicated, between rural and urban users—in terms of access to vital information technologies.

C. Frederick Weingarten alluded to the great intellectual traditional of sharing ideas that characterized the efforts of early developers in this field, and that characterizes first-rate scientific research generally. Will existing or new intellectual property laws erect barricades to otherwise collegial communication? Care must be taken to attend to these possible effects which can only impede technological advance over the long run.

D. Fourth is the international setting. This naturally raises the question of the extent to which steps to encourage software production will affect our national balance of trade. Related to this is the question of piracy on an international scale as devloped by Harvey Zuckman's questions to the panel he moderated earlier today. There is also the question of our ongoing obligations under international copyright treaties. In this last connection, I might note that while it might seem efficient to break copyright into separate laws, each dealing with a discrete form of subject matter, this method, to the extent it produces substantive gaps between our law and the laws in force elsewhere in the international copyright community, may put us in default of our obligations under the Universal Copyright Convention and effectively bar us from ever joining the more rigorous Berne Convention.

What institutions can Congress employ and encourage to engage in the needed, systematic monitoring and oversight?

1. More meetings such as this would certainly be productive; but they are also incredibly taxing, and I don't know how frequently the members of Congress—occupied with so many other concerns—will find themselves able to pay that tax.
2. The hearing process is certainly another possibility. I would remind you that Macaulay's seminal statement on copyright, already alluded to by Judge Breyer and Professor Kernochan, was made on the floor of another great deliberative body—the House of Commons. The broad-ranging hearings conducted by Congressman Kastenmeier's Subcommittee this past July, on copyright and the new technologies, is certainly a more immediate example.
3. The governmental commission is another possibility. CONTU—the Commission on New Technological Uses of Copyrighted Works—created by the 1976 Act, provided some helpful guidance in the area. Senator Mathias' Bill, S. 2192, to establish a Commission to Study the Concept of the Public Lending Right also points in this direction.
4. Perhaps, too, there is a need to look outside Congress—to some independent facility, possibly university-based, funded through foundations or supported through some other means, to provide the Congress with systematic advice on these important issues of public policy.

I do not mean to suggest by any of this that the task of designing such an institution for oversight and reporting will be easy or quick. I only mean to suggest that, if I read the evidence presented at this weekend's proceedings correctly, the task is an important, and possibly a necessary, one.

[Press Release]

NEW TECHNOLOGIES IN THE INFORMATION AGE: COPYRIGHT OFFICE HOSTS CONGRESSIONAL COMMITTEES AT NEW TECHNOLOGIES SYMPOSIUM

"So that intellectual property law, especially copyright law, can be a little wiser in responding to change, we have convened this symposium," said Rep. Robert W. Kastenmeier (D.-Wis.) in his opening remarks at the Congressional Copyright and Technology Symposium held February 4, 5, and 6 in Fort Lauderdale, Florida.

Noting that Congress faced a tremendous challenge in adapting the copyright law to "the greatest technological changes in history," Rep. Kastenmeier welcomed more than 70 representatives of the Congress, industy, business, law, and education to the Symposium.

"We would rather not be reactive; we would rather understand and anticipate change, if that is possible," Rep. Kastenmeier said.

He noted that he and Senator Mathias (R.-Md.) had requested that the Copyright Office organize a symposium which would bring together futurists, high-tech representatives, and copyright experts because "technology is already overtaking the complete revision of the copyright law that we accomplished in 1976."

Senator Mathias, in his opening remarks, likened the Congress to Balboa when he first viewed the Pacific Ocean lying before him—full of wonder at a great new resource but knowing that what it meant was a matter of conjecture.

Senator Mathias said he believed Congress should leave the Symposium "with a new will to adapt new knowledge to the principle of copyright."

Librarian of Congress Daniel Boorstin explained his belief that society was prone to the "displacive fallacy"—a belief that every new technology would displace the old one . . . that television would displace radio, that electronic news would displace print journalism, that the auto would displace the foot . . ."

But the development of technology is not displacive; it is cumulative," he said, "and that is what gives interest to what we are concerned with today."

Register of Copyrights David Ladd expressed his appreciation that the Symposium would provide an atmosphere where issues could be approached descriptively and analytically, not polemically.

"Everyone knows how in the last two decades the debate on these issues has been constant and even rancourous; we hope that at this symposium people can get the long view or least a view of where the horizon lies in respect to the effects of technological change," he said.

Attending from Congress were Senators Mathias and Jeff Bingaman (D.-New Mexico); and Representatives Kastenmeier, Frederick Boucher (D.-Va.), John Conyers (D.-Mich.), Hamilton Fish (R.-N.Y.), Carlos Moorhead (R.-Cal.), Harold Sawyer (R.-Mich.), Larry Smith (D.-Fla.), and key staffers from the House and Senate Judiciary Committees.

Nationally known authors Joseph Lash (who wrote, among other books, "Eleanor and Franklin"), and Frederick Pohl, author of many prize-winning books of science fiction, also attended the Symposium, and spoke of the effect of new technologies on the distribution and marketing of their books.

"We may be entering a post-print society," said Martin Greenberger, IBM Professor of Computer and Information Systems at UCLA, who delivered speech on "The Long-Range Future Impact of Computer and Communications Technology on Society."

The Symposium also featured hands-on demonstrations of new technologies. During these demonstrations both Senators and Representatives and others could be found cheerfully others could be found cheerfully punching away at home computer systems, gaining experience with the technology of satellite telecommunications systems, and trying out teletext and videotext services."

Also on view were optical and audio laser-read disks—their demonstrators predicted that within the decade consumers will throw away their turntables and replace them with laser-beams.

One of the more dramatic exhibits featured a large satellite dish receiver set up outside the meeting room to demonstrate that new technology.

Other exhibits included a CBS teletext service called EXTRAVISION which will provide viewers with free news and weather up-dated every 15 minutes, software from Visicorp, home entertainment centers from North American Phillips Consumer Electronics, and the PLATO software learning system for elementary and high schools, Publisher John Wiley and Sons, presented a sample of their electronically published work, as did the New England Technology Group and the Sony Corporation.

The Library of Congress provided an overview and demonstration of its optical disk project; Joe Price described how the project may solve long-term problems of preservation and access.

On the second day of the conference panels discussed several issues relating to the law.

Topics were "Information Processing in the Future," "Publishing, Libraries, and Education," "Mass Media Distribution: The Future," and "Administration of Rights in Copyrighted Works in the New Technologies."

Moderators included Joe B. Wyatt, Chancellor of Vanderbilt University, Toni Carbo Bearman, Executive Director of the National Commission on Libraries and Information Science; Harvey Zuckman, Professor of Law and Director of the Communications Law Institute at Catholic University, and Paul Goldstein, Professor of Law at Stanford University. Professor Goldstein also served as Symposium Rapporteur.

Panelists included representatives from the judiciary, high-technology industries, libraries, publishing companies, education, the film industry, sports broadcasting, and academia.

A tour of the computer-robotics training facility of the IBM company at Boca Raton was the last event of the Symposium. IBM representatives explained to the congressionals delegation how they marketed their computer programs as well as their interpretations of the copyright law and its protection of their products. Other IBM technicians provided demonstrations of robotic arms controlled by computers sensitive enough to detect defects in the materials being carried.

Congressional Copyright and Technology Symposium

SUMMARY OF PROCEEDINGS

Day 1: February 4, 1984

Opening of the Symposium—Remarks by Rep. Robert W. Kastenmeier, Senator Charles McC. Mathias, Jr., Librarian of Congress Daniel Boorstin, Register of Copyrights David Ladd.

Overview—"Electronic Technology for the Policy Maker," Haines Gaffner, President, LINK Resources, Corp.

Introductions to Demonstrations—Donald Devine, Chief Executive Officer, Trilog, Inc.; Pat Wilson, North American Consumer Electronics; John Sabio, SATTECH; Bob Quinn, NABU Network; and Gene Leonard, VVR Associates.

Educational Technology—Jean Harris, Vice President, Control Data Corporation; and Karen Cohen, President, Continous Learning Corporation.

Electronic Publishing—Myer Kutz, John Wiley & Sons, Inc.; Albert Crane, Extravision Service, CBS TV; and John Wooley, Editor, View Data Corporation.

Optical Disks and Automated Libraries—Joseph Price, Chief, Science & Technology Division, Library of Congress; Steven Gregory, New England Technology Group; and John Hartigan, SONY Corp.

Dinner speech—"The Long-Range Future Impact of Computer and Communications Technology on Society," Martin Greenberger, IBM Professor of Computer and Information Systems, UCLA.

Transcript of Proceedings

Mr. Goldstein. Good morning. My name is Paul Goldstein. I'm Professor of Law at Stanford Law School. I'm very happy to welcome you to this weekend's Congressional Copyright and Technology symposium. I will be serving as the rapporteur for the program, summarizing the lessons that I hope will be exposed here during the next two days.

Let me alert you, before we proceed, that in the spirit of the new communications technologies to which this symposium is devoted, all of the mikes are live. All you need to do to speak into them is to pull them toward you. I needn't tell you what to do if you don't wish to have your remarks overheard by others.

Now, obviously I will have more time toward the close of the session to put in my two cents' worth. Let me just say now by way of introduction that, like you, I believe that technological advance is central to our nation's welfare. And like all—or at least, I hope, most—of you, I believe that technological advance depends not only on our native ingenuities, but also on the ability of systems of intellectual property to help foster innovation in ways that are both efficient and equitable.

This symposium represents in my judgment an extraordinary, and extraordinarily important, step toward obtaining a thoroughly objective, unbiased understanding of the public policy implications of copyright law and the new technologies.

Now, we are very fortunate to have with us the leaders from the Senate and the House respectively dealing with copyright matters—Senator Charles Mathias and Representative Robert Kastenmeier.

Congressman Kastenmeier, would you like to start us off with a few remarks?

Mr. **Kastenmeier**. Thank you, Mr. Goldstein. It was a pleasure meeting you just earlier this morning, and meeting many of the others who have come here. I'd like to extend a welcome to Senators and to my fellow House members, and to those otherwise participating here at this symposium.

Senator Mathias and I particularly are grateful to the Copyright Office, especially David Ladd, for undertaking the actual implementation of an idea that the Senator and I have thought about for some time, to hold just such a meeting. We were finally able to bring it about. But I am very pleased that we are here away from many people, away from Washington and the pressure of business there or other places, so that we could be here in a beautiful and somewhat detached environment to consider what I think are important questions.

The object of helping to shape copyright or other intellectual property laws in response to the greatest technological changes in history is our challenge. We all know that the state of the art—including computers, electronic communications—is such that it's almost impossible for the casual citizen to remain even vaguely conversant with the implications, or master the technology in anything.

Our children obviously seem to be more able to adapt to these changes than some of us. We nonetheless have a responsibility to satisfy. And in fact, we have been given opportunities in the past to recognize our responsibility.

In 1976, a major revision of our copyright law gave us a taste of trying in some respects to adapt the law to technological change. Even then, with respect to precise language regarding computer software and cable television, for example, we either had to temporize in terms of the law, or recognize that we would not be able to respond until some later time.

In the House, we have been holding hearings on "copyright and technological change," so as to enable us to see even contemporary questions of conflict among industries, proprietors and users of copyrighted works in what is obviously an environment of an explosion of litigation and political contest, much of it suggesting or demanding statutory change.

We face that environment today. And we faced it last year and the year before. In order to better grasp its implications with respect even to today's challenge, much less to tomorrow's, and so that intellectual properties law, particularly copyright law, can be a little wiser, a little more comprehending, in responding to technological changes, we have urged the convening of this symposium.

We hope that both those who tell us what's going on, those who participate, and ultimately all of us, will in a broader sense learn something from these several days here. We then will be able to communicate it to others, most notably for our part to our fellow colleagues in the Senate and House, and we will be able to somewhat more wisely respond to both changes today and changes tomorrow that are indicated with respect to copyright law. We would rather not be reactive. We would rather understand and anticipate, if that were possible.

But in any event, we do hope to leave this place a little wiser and a little better informed.

And so I congratulate you all for coming, and express appreciation for those of you who contribute positively to the proceedings. And I wish you all luck.

Thank you.

Mr. **Goldstein**. Thank you, Congressman Kastenmeier. Senator Mathias, do you have a few remarks?

Mr. **Mathias**. Thank you very much, Mr. Chairman. I just want to join with Bob Kastenmeier in saying a word of welcome to everyone who is here.

In his lucid and lawyerlike dissent in the "Betamax" case, Justice Blackmun said: "Like so many other problems created by the interaction of copyright law with a new technology there can be no really satisfactory solution to the problem presented here until Congress acts."

In one sentence, Justice Blackmun has defined our purpose and our goal in this meeting.

But, as the old spiritual suggests, talking about heaven and getting there are two different things.

In a normal period of history new inventions are perfected and come to the market in a more or less orderly way, at a gradual pace and with time for consumers, entrepreneurs, technicians and, finally, the law to make normal adjustments to accommodate the new technology. But the climate in which we are meeting is different. We are witnesses not to gradual change, but to revolution. Like many revolutions, it not only threatens to overturn the obstacles immediately in its path, but also to topple or overthrow the basic principles of law and order. We are not only learning new ways to communicate, record, transmit, store, retrieve, and manipulate every form of sound, data and information, but in the process we are threatening the ability to maintain the principle of intellectual property—the principle of copyright.

I have thought about analogies in history to our situation, and the image of Prince Henry of Portugal came to mind. I thought of Henry the Navigator, standing in his school for sailors at Sagres, on top of the great cliffs that line the shore, looking out to the horizon and wondering what lay beyond. But at least Henry the Navigator knew what he was up against. He knew the sea, its history, its habits, its dangers and something about how to live with it. We are not so well-informed about our problem.

Perhaps we are more like Balboa, (notwithstanding Keats' Cortes) "Silent upon a peak in Darien". When Balboa first saw the Pacific Ocean, the great South Sea, he could hardly have known what he was seeing. A great sheet of water lay before him, but what it was, how far it extended, what shores it lapped and what it meant were all matters of conjecture.

That is more like our situation. We know that we are on the edge of a great unknown and that is why we are gathered here.

I am sure that I speak for every one of the Congressional pupils at this seminar in thanking the Register of Copyrights, the Librarian of Congress and their staffs, the participating industries, the lawyers and judges, the professors, the scholars and the authors who have joined here in an effort to lighten our darkness. I only regret that Alan Latman is not able to be with us.

I hope that we shall leave this meeting with a better sense of what it is that we need to do. But my optimism is qualified. Justice Blackmun, with his customary personal courtesy and with the traditional observance of comity between the coordinate branches of govenment, did not include the Congress in his indictment "that the Court has tended to evade the hard issues when they arise in the area of copyright law". Those of us who lived through the prolonged debate over a modest amendment to accommodate the juke box know that the Congress is as guilty as the Court.

We should resolve to leave this meeting not only equipped with new information, but with a new will to adapt the new technologies to the tested principles of copyright and to preserve the concept of intellectual property that maybe more important to the future than it has been in the past. Mankind has progressed in its idea of property. Once a shepherd had to keep his flock in sight at all times. Then the recording of title developed and constant physical possession was no longer necessary. We then accorded ideas and creative thoughts the character of property and protected it by copyrights so that it could be released from vaults and archives and be made abundantly available to all who could use it without prejudicing the creative rights of the author.

We now suspect that such subjective property, perhaps never even embodied in such a corporeal form as writing, will be more and more important to modern civilization. If this evolution is to take place in an orderly way, without destroying the base of intellectual property and crushing the creative spirit, then we must make the best possible use of the next 48 hours.

Thank you very much.

[Applause.]

Mr. GOLDSTEIN. Senator Mathias, Congressman Kastenmeier, thank you very much for being with us. Thank you also for your fine introductory remarks.

We're also fortunate in having with us today the Librarian of Congress, Daniel Boorstin, who has graciously made time available from his schedule to be with us. Dr. Boorstin, do you have some remarks?

Mr. BOORSTIN. I might just add a word to what we've heard. First, I would like to thank Congressman Kastenmeier and Senator Mathias for having sparked this meeting. Their interest not only in what we are doing, but in what we ought to be doing and what we might be doing in the future has been very important to us at the Library.

I would like to spotlight briefly the special significance of the fact that this meeting is being held under the auspices of the Library of Congress, our national library. Perhaps in no other country in the world would a conference of this kind be held under the auspices of the national library. Our national library expresses an especially American symbiosis—of the world of learning and the world of representative government. The unique comprehensiveness of our national library, which we call a multimedia encyclopedia, alone of all national libraries includes the products of all technologies, photography, phonography, broadcasting, electronics and the others still to be.

We at the Library of Congress are committed, jointly with the Congress, to facing the problems and opportunities of technology.

Justice Stevens in the majority opinion in the Sony case observed that the phenomenon of copyright itself is a byproduct of the great technological advance, perhaps the greatest technological advance in human history, the development of printing. And it was that technology that gave rise to copyright, as Senator Mathias has observed, and it is the changing technology that poses the problem we want to think about today.

The history of technology, perhaps more than any other kind of history, is full of premature obituaries. We are prone, especially in this fastmoving country, to what I would call the displacive fallacy, to believe that every new technology displaces some old technology. That television will displace radio, that electronic news will displace print journalism, that the automobile will displace the human foot, and that television will displace the book.

But each of these new technologies has prepared new roles for earlier technologies, and that is our concern here today. The development of technology is not simply displacive, it is cumulative.

Every older technology is iridescent, and appears in a new light from every new technology. We are especially fortunate today in having with us people who are so well informed, people on the frontiers of these problems. We want to thank them, we want to thank all of you for this collaborative effort. And we hope that out of this will arise not only an illumination of this problem, but new opportunities and new tasks for the Library of Congress.

Thank you.

[Applause.]

Mr. GOLDSTEIN. Thank you, Dr. Boorstin. David Ladd, the Register of Copyrights, has played a central role in putting together this symposium. David is with us. David, do you have some remarks?

Mr. LADD. Thank you, Paul. I take it as my principal assignment to get out of the way, as quickly as possible, having attended to the mechanical details, so that we can get into the program after those very interesting and welcoming speeches that you've heard.

Congressman Kastenmeier and Senator Mathias have told you about the origins of the idea for a meeting like this. And everyone here in this room is fully aware of how typical and numerous and—within the last two decades at least—how rancorous the debates about copyright policy have become.

So we deemed it our purpose here to try to provide a symposium where people can get the long view, or at least as long as we are capable of, in terms of what the horizon is, in terms of technological change, and what problems that change are likely to pose in the adaptation of copyright.

To accomplish this, it was our purpose to invite here those from the hardware and software industries, from the copyright industries affected, and those people who could give us the full range, and the full spectrum of opinion on these various issues, and to create a climate in which these issues were approached descriptively and analytically, rather than polemically.

And that's why in the letters of invitation that went out, we urged that those people who did participate come prepared to discuss the issues in that mode. And I simply want to remind you of how important that approach will be to the success of our meeting.

In the end, you will judge how successful you and we together have been in creating that climate. In the meantime, I simply want to thank all those people who have generously responded to our invitation, those from the industries which are providing equipment here for us to see how it is used, from those of the industries that have interests at stake in the issues we are to discuss. And above all, for those people on our own Copyright Office staff who have worked so hard, and often under difficult circumstances, to put this meeting together.

I want to tell you also that this meeting is being videotaped. We do not know, we'll have to discuss later with the staffs and the committees, how those tapes are to be used. But the entire proceedings here will be captured on videotape.

Now, let me lead you into the substantive program for this morning. And it's my pleasure to introduce Haynes Gaffner, whom I met for the first time at this meeting. Haynes is founder and president of LINK Resources, Inc. It is a leading computer, communications and technology research group in New York. It serves 300 worldwide companies in their planning and implementation of projects which use the new electronic technologies. He has 25 years of experience in the information industry, and we are going to be the beneficiaries of that experience this morning.

Haines, will you lead us into an overview of this morning's program, and shepherd the work of the morning for us?

Mr. **Gaffner.** Thank you, David. Good morning. I was trying to figure my role in this as we serve these 300 companies. And it's kind of like when Henry of Portugal had—Henry the Navigator saying, I want to take this trip. He had to turn into a geographer and say, what is this going to do for Portugal, is it going to make any money or not. So that's the role that LINK and myself play, working entirely in the commercial arena

I know very little about the legal aspects of the copyright issue. And I'm not acquainted at all with what goes on in Washington and the problems it takes to bring about the statutory change. My role is strictly to help companies that are creating these new technologies, to exploit them in the marketplace and make money and not lose money. Because in this new electronic media arena, far more money today has been lost than made.

And my role this morning, then, is to take you on a tour of these technologies as a prelude to your hands-on demonstrations which are set up. And with all the electronics working, I'm sure that you'll be able in this 48 hours to have a lot of experience in trying these various devices.

Also, I hope in an overview to define some of these technologies and put them into some perspective. That is one of the toughest challenges in this field. I would say that during the 45 minutes that I'll be talking, I would encourage questions. I think that's why we're here, that's why we have a small group of us. We didn't want a congress of two or three hundred people.

So if you want a definition of a certain technology or to raise a question, that's the purpose of these meetings.

I tried to put myself in your shoes, with the responsibilities you have as congressional people, in so many different subjects. How can you avoid getting caught up in the unfolding complexity of these technologies, and especially, you're victim to what so many people are, of the hype that the press gives to this whole field. They have a real relationship with direct broadcast satellite and personal computers. And every day there are three or four articles in the paper. It must be confounding.

So I'd like to present six simple guidelines that I hope I'll be able to put over in this tour. First, and this is going to be the hardest you've got to keep the focus on the content and the software and the intellectual property—all these terms are used synonymously. In fact, that's one of the problems with the new media, is that there are so many different terms that mean the same thing.

We happen to use the new electronic media as an umbrella term for what you use, new technologies, all of these are synonymous. But as you listen, you've got to think simply of what will my decision making role be regarding software or the content.

Now, that might sound simple, but the reason that it gets confusing is that the second point is that change is all going on from the creation of the software on through the system. And the first major area of turmoil is in the conduit transmission distribution area. And I'm going to show you several slides up front that show from some different perspectives that we're really talking about the basic characteristics that are common, and that once you've got the software, there's just a whole range of different ways to transmit it.

Our company just spends all of its time in this area and in the commercial arena. We're up to 35 people. And this is an explanation of, some slides that say IDC on it, that's our parent company. Our parent group publishes such publications as Infoworld, Computer World, about 50 publications around the world in this area. And we focus on the research side of it, based in New York. But are totally dedicated to the new electronic media.

Now, these are some of the systems that we will be talking about. Some of the technologies you've heard about. And what I'm trying to say is, don't get hung up on these various systems, because they're going to be continuously changing. That rule number two is that you've got the area of transmission or distribution, and to get a handle on the fact that all software is transmitted somehow. That's a good goal.

The third rule is that after it's distributed, it has to be accessed by some device, a personal computer, a TV set, a video cassette recorder, so that there's all this turmoil going on in the access device, which we sometimes call equipment, sometimes hardware. But that's the tool that is used by the individual to access it. So there's three things. You've got the software created, you've got the transmission, and the access device. And the turmoil is all occurring in the distribution and the access device. But it shouldn't really hamper your ability to focus on the software.

This is one of the problems that you face, is that the venture capitalists and the people putting up the money are constantly trying to stay behind the blade. But you having to do the law also have those challenges. Because all of this turmoil is going on, you can't create a law too soon. And one area, Dr. Boorstin mentioned, for instance, this cumulative effect. The problem with cumulative effect is that many of these technologies are there for only a year or two, and then die out because of some new one coming along. And some of them are actually foisted on the public and you don't know it until they're on the marketplace and the market doesn't respond.

So another area to think about is the—when you talk about all the Bell companies, ATT breakup, is the fact of separating in your mind national distribution via satellite and local distribution or local loop, which is the cable system. And you don't have—there's all these technologies that take place either on a national basis or a local basis. And a lot of the fighting is going on in that arena. But if you can just come away from 48 hours of understanding that that's another major rule area.

The fifth one is—and it's tough—trans media analysis. The problem is, a person in the cable industry only thinks cable and the person in personal computers only thinks personal computers. But what you've got to do, people with your responsibility, is recognize that you're dealing with a total spectrum, and something happening here affects what's happening in another technology. So you've got to look at the whole arena.

And the last point is that you often hear the term convergence. This is all coming together, there's no doubt about it. And the problem with convergence is, it makes each of the individual parts transparent. So it's more difficult to see in looking at a TV screen, something coming over it, all of the various networks and systems and technologies that brought it there.

Now, let's take a look at this two year old slide. I'll tell you that today only two of these are really successful so far in the marketplace. Now, we're an unbiased analytical company; we have no axe to grind. So things I say will not necessarily be agreed to by others. But the real winners here, the real winners are the videocassette recorder and the personal computer, which are over there broken out as standalone devices.

Now, granted, both of them are now being used as access devices to systems, so you can see that they are even becoming one-way and two-way. When you put a modem on a personal computer it becomes a terminal. But still, much of the growth of the PCs that made it the hottest item in the last two years has been the standalone software that you can use on it, without even having to communicate over any transmission lines. And the vidocassette recorder, you can rent these tapes, use these tapes, stand alone, turn them back again, two bucks a night.

Now, the rest of these are all doing fine. Of course, we've all heard about the problems of cable; videotext, which was formerly Vudata, has not fully gotten off the ground yet. On line data bases are growing at 15 percent, 20 percent a year. But many of the technologies you hear about come and go.

Another thing to focus on is that these channels that you're looking at that are constantly changing have a number of applications they are involved with. And we're focussing today—we're looking primarily at education and information and entertainment. But you've heard a lot about home banking. The banks are getting very involved in exporting these for transactional purposes. Ad agencies are trying to use these same channels to put advertising over them, et cetera.

Now, one of the problems in Washington, from what I've heard about it, are the number of lobby and interest groups that use these. And this just gives you an idea of the types of companies who are coming into this arena from various perspectives. Again, let's go back to those principles. You've got those companies on the left who create the intellectual properties. That's the ones which I imagine—and I'm not an expert in your field, that you are primarily concerned with protecting.

Then you have all of these various companies, very powerful companies like AT&T, GTE, the cable companies, the time sharing companies, all of those companies are transmitting it. They don't really care that much about who's being paid what as long as they can get it out to the user and be paid for it, and make a profit doing it.

And then you've got those companies that create the devices, the equipment. And they are often coming out of the computer electronic arena; they are the ones you put your hands on and use them.

On this slide, that's the software, the intellectual property. I'm going to read it quickly. Now, remember my point about national and local distribution. That's the main purpose of this slide, is to get a good understanding of the differences generally between national and local.

But over here on the left, and again, this is not changing so much, the software. We have film, sports, information, news, education, music, culture, advertising, games and messages. Okay, that's the software, that keeps coming out from the creative individuals. Then how it gets through the system is where the problems come up that you face.

And as you can see, in the national distribution, you have the electronic means of distributing it. Or for stand-alone type of material, then you have therein physical properties. And they move to retail stores or increasingly by mail order, advertising, direct response. And in the local outlet then, you have your local broadcasting affiliates, the cable systems that are working in a given environment, just like Fairchild County is now being wired. And then you have all of these various acronyms that you'll continuously get confused about.

Now, let's go into your home. How many of you here today have a videocassette recorder at home? Okay, 50 percent. How many have a personal computer at home. About the same, 50 percent, already. How many have a video disc player? Some real braves ones, okay. How often do you use it, Chris?

Anyhow, remember the comment about convergence and transparency. Most people are not going to have all these devices and it really doesn't matter. The main application in the home is entertainment and how that entertainment gets there. These are a variety of technologies that can deliver it, delivery again. And a variety of access devices used with the focus being on the TV set in this regard.

And I'm not going to spend a lot of time. unless I get questions from you, going into specific definitions of these various terms. It gets too confusing. And I'm trying to maintain, although many of you will probably disagree, that that's not too important to understand each of these individual technologies, it's too confusing. And some are here today and gone tomorrow, and by the time you learn what it means, what does it really matter. What's important is to focus on the software and how the people are being compensated for getting that new good piece of entertainment to the user.

Yes, please. Just speak out.

Response From Audience. Do you have the slides you're showing us in print form?

Mr. Gaffner. That's a good idea. David, I'd be happy to pull these together later on. We could do that. On most of these slides, we—excellent question. Yes, we could provide—I think there would be about 40, 50 slides that would help you later on in breaking these out.

Now, these are—oh, I'm sorry, yes.

Response From Audience. Any possibility you can go back to that distribution slide? You went through it so fast, it was really helpful.

Mr. Gaffner. I am paid to sometimes make remarks that people don't like to hear. But let's face it, a lot of the communications, the ones that involved on-line telecon, they haven't done as well as the physical stuff that's been able to move through the system in a cassette form or a diskette and then be used locally by the person who has a VCR or a PC without any tie to communications. And believe me, our whole company is built on watching the various communication technologies. But some of the real winners in this are the software that you plug in and get from a local store. So you cannot forget physical distribution as part of these scene. And that's really the success of the personal computer industry, is that they saw this and they exploited it.

So since the personal computer is a major part of the discussion going on here, and one of the toughest areas to protect, the piracy of software, I picked two slides out, just up front, to show you that the same way of looking at it from author to user, even though we're not talking here about an electronic distribution system, we're talking about physical distribution, occurs. The author creates the software and it's very much like, as many people have said, book publishing. And you'll be hearing from book publishers in the 48 hours. It moves through the channels to the distributor to the retail stores, or other ways to the user.

And the primary area of creativity that has made the PC software area boom, for instance, is really in the distribution outlet, even more so than in the creation of the basic products. You've got thousands of programs, but some of the ones that are most successful have been those that had good marketing. And to figure it out, you had to use a lot of channels of distribution to get it out to the user, physical channels of distribution. And maybe some of the best software products might not even be known because they never got into the distribution channel. Like we're going to see about Plato later on.

Now, Plato, as everybody knows, from Control Data, invested a billion dollars in trying to deliver it all electronically. But now they're coming around, and we're going to see a demo on how it can be delivered in a physical form. But the problem is, when you put it on a TV set, they all look the same.

Now, somebody might pick this apart, but I know you're concerned with these areas. This is from our research in the marketplace, shows how a personal computer software, the money is divided between the authors, distributors, publishers and retail store.

Again, no electronic distribution involved in the booming PC software business. But common characteristics, again, is part of the whole same arena. Now, here's a slide we just created a month ago, because now, with the breakup of AT&T, there is so much emphasis on all of the new communications markets. Cellular radio, paging, things we didn't even hear about a year ago. Side band, vertical blanking intervals. Satellite has been with us a long time.

Now, I maintain once again, you could try to learn all of these, and maybe you can have people on your staff who could learn what all these mean. I don't really think they're important for the challenge to you. You have to concern yourself with what's on the left here, what the information provider creates is going to go through this same transmission scheme. It's going to have a terminal and an access device, CRT meaning a cathode ray terminal, PC meaning personal computer, obviously.

Now, a new problem you face, however, is in the last one on the right, the storage, because this is where the user, as David Ladd pointed out in his excellent writeup in October '83 that was mailed to us, that now the user can store this so cheaply, you can make decisions to copy music. Now, you wouldn't care if your kid copied Michael Jackson singing Thriller. But what about copying a movie? Well, the court right now says, okay, you can copy a movie. But then, how about copying data bases on your personal computer and then storing it locally? Nobody is paid royalties to create a data base, et cetera.

So there is so much new evolution going on in technologies and how to store this at your local access point and take it down, down load it. You'll keep hearing about downloading. That gets very complex. And again, I sympathize with the challenge you have ahead, but you have to focus again on what's on the left and how the user uses it on the right, and not too much in between.

Now, just taking a slide of the on-line data base industry. This is Mead Data, Lexis, the New York Times information bank, Dun & Bradstreet credit information on line. We've all heard about these on-line data bases. The Medline from the department of medicine. The government has many data bases.

But look at these same principles. Somebody creates the data base; somebody then distributes it through a transmission network to the user. We're just trying to get an overview of how this whole arena works. Or take videotext, which we've heard all about. Now, this is the slide that shows AT&T's master plan that was fought and challenged and then—gosh, I can't remember if it was—then the government decided AT&T could not go into electronic publishing for seven years.

Well, the Bell operating companies and others are now looking at how they can get into this somewhat; you'll hear more about it. But in effect, if you'll look over to this case on the right, there is where you have all the intellectual property created. And then it flows through the—in this case, AT&T's system. And you don't have to worry about that middle point, to the terminal. And there's a lot of evolution, all kinds of new terminals that are going to be coming out, that are going to be—come in your kitchen, they're going to enable you to access a videotext separate from your TV set. All that change in terminals again shouldn't have to concern you too much, I maintain.

Now, this talks about conveyance.

But this shows that a range of electronic information services shown across the top are really brought together through this videotext type of distribution system, or through the personal computer. And they become transparent. And that's really an area with which you don't have to concern yourself, because you're really thinking about the person that creates the information that goes back behind those top area services. But it's one of the complexities that keeps coming up in your challenge.

In 1985, unbelievably for the first time, a shipment of personal computers in magnitude will be greater than mainstream computers which have been around for 30 years and that have built the whole computer industry. And that's only a year away.

The problem is, if you're watching this personal computer industry, look, Commodore just finishes its best year, and the chairman quits, the president quits. And suddenly the next week, everybody says Commodore is going to hell, after they just beat everybody out, beats the pants off them. The journalists come out and say Commodore doesn't have any future right now. I don't understand why they say that, just because four people left. They've reached a billion dollars in about five years. Take Texas Instruments. They were able to lose $800 million or something in one or two years in the personal computer business. Talk about the revolutionary dynamic forces beyond our control.

And we who are not stockbrokers—finally, Texas Instruments says, we're getting out of the personal computer industry, and the stock goes up 50 points. It's hard to understand. You'd think if somebody admitted a huge failure the stock would go down 50 points. [Laughter.]

Or take Lisa. Lisa didn't really go anywhere. But how much do you read about Lisa? Well, now they say that John Scully and everybody out at Apple are betting their whole company. And Steven Jobs, he's got a billion dollars in the bank, he's betting it all on McIntosh. Well, why is he doing that when Lisa didn't work? I don't know, but everybody says, Lisa is revolutionary, it's going to change. And we'll ask the people over at IBM on Monday what they think about McIntosh. But where will McIntosh be a year from now?

Or take Atari. Here's Warner Communications and Rupert Murdoch and all this confusion, and one billion dollars in losses. And they're trying to start a Atari tell, and the PC in the home is going nowhere, and along comes IBM and McIntosh saying, we're going into the home where Atari has been for four years and lost a billion dollars.

The rules are not there. They are not there, and that makes it very complex. And again, you really can't follow all those week by week, month by month changes that will continue. You've got to focus again on how to protect the guy who creates the software.

You're going to have 16 million of these devices at a minimum out in the hands of users—that's the only point of this slide—by 1986, and possibly most of you will have them in your offices and homes by then. This is true. That's why you face such a challenge.

And this was already alluded to. The younger people understand it a lot better than we do in many cases. But talk about mass distribution of computer technology, it's happening. But remember that—stay behind that cutting edge blade. That's the problem you face, as you know. As it all moves out there, a lot of it doesn't work.

So this gives you just a few quick slides. And let's just take a profile based on our survey. Here's the typical corporate user of a PC on his desk. But this is just right now, because it's going to be all of us within three to four years.

And here's the typical home user. Yes, question, good.

Response From Audience. [Inaudible.]

Mr. Gaffner. They now are coming out with a new attractive packaging to encourage females to buy. [Laughter.]

I totally agree with you. How many—there's no doubt that from the surveys, unfortunately, the PC at this point in time is one of those few areas left for male domination. [Laughter.]

I'd rather not get hung up on the feminism problem on this, but I brought it into my own home and my son and I used it, and my daughter didn't like it, walked away from it.

Yes.

Response From Audience. I'm going to try to bail you out. [Laughter.]

May I suggest that the main purpose here of course is our conversations together. But please, when you speak, just give your name. You don't have to give your organization. So later on, when we use the videotape—and I've changed the subject.

Mr. Gaffner. Oh, I see. Because of the videotape, that's why they want it. Please.

Response From Audience. To raise a gender neutral question, there's one concept that's central to much of what you've talked about, but which I've seen described in perhaps a half a dozen different ways in the literature. The microprocessor. Can you describe briefly a unitary meaning of that?

Mr. Gaffner. Yeah. I was hoping somebody would ask that. But I—in the early years, what was the difference between a PC and a microprocessor? Well, a microprocessor is really the electronic kit that does the job, and the personal computer is when you put it all together into the machine, and what makes it work in the system. But that's a good question. And the terms micro and personal computer are used synonymously. Micro does not mean any longer microprocessor, like it did before. We don't really hear the term microprocessor used with that electronic chip very much. And really, it's the electronic chip that's behind all of this change, really. It's what's going to make your telephone smarter, et cetera.

That's a perfect question. I hope we'll get more like that. Yes.

Okay. Yeah, no, mainframes are computers used in computer centers, in a company or a government office or a school. And they're primarily run to process data at that site, and then sent back to the user, often in printout form, or you might have a terminal, which is not a personal computer, that accesses the mainframe computer. And that's what the whole industry was built upon.

Now, the personal computer is a decentralized personal device that you use at your desk or work station, or in your home. Well, one other way—personal computers are generally ten thousand dollars and under, and mainframes are really $200,000 and up.

I totally agree with you. That's the way the computer industry is going. And we'll have discussions on that tomorrow. And that's why companies like NCR, Burroughs, UNIVAC, Control Data and others that did not go fast into PCs are very worried, because really, you only had two majors, IBM and Digital Equipment. going early into the PC, and Wang. But the others lagged behind, and so therefore their main market is evaporating and you've asking the question that many people are, including the people who run computer centers. Why should I stick with this big clunk and spend all that money?

But there are a number of reasons why we don't have to get into that today; both industries will continue to flourish. Again, this is just the results of our independent survey, I'm reporting the results, that there is no doubt that—when you take to these earlier—it doesn't mean that in five years it will all change. By the time you make your law, it has to be a law obviously for everybody.

Yeah.

Response From Audience. When you use the term electronic interface, are you using it synonymously with semiconductor chip amd micro electronic chip? Do those all mean the same thing?

Mr. **Gaffner.** I heard the last part, not the first part.

Audience. The term electronic chip.

Mr. **Gaffner.** Yes, I'm using them all synonymously.

Audience. For semiconductor chip?

Mr. **Gaffner.** Right, yes.

Audience. Okay.

Mr. **Gaffner.** The specific applications or functions today, and more and more functions are being created monthly. Again, I will be getting these slides to you, so I will make a certain point on a certain slide and then kind of move on before you have time to study it all.

This simply shows that the size of a PC software market alone in 1987 will be about seven and a half billion dollars. We predict that the on line data base business then will be about three billion dollars. It shows that both of them were at about $100 million in size last year; they're growing at a tremendous pace. Sorry, at one billion dollars size in 1983.

Now, this gets into the problem that you face. There are so many producers of these software devices, unlike the video software industry, that PC software has lent itself to thousands and thousands of authors. And one of the problems facing book publishers is, how to sort out the good from the bad. Of course, you have all these youngsters making enormous profits. They're the ones that are protected, but they're the ones that are making the industry grow.

And as I said, this slide just merely shows that unlike most of the new technologies, they came up with the concept of a variety of different channels of distribution, which really made the industry take off in a very short period of time.

This simply shows that a number of book companies are getting in. I wouldn't bother looking at the details of it, but these are just other channels of distribution book companies are using. The point here is that initially, you could look at a list of the 50 top software producers, and they were all unknown names. And some of them have become important names today.

Then the big companies are now moving in, and we have people from those companies here with us.

Response From Audience. You may have said this before when I was out of the room. What is a systems house?

Mr. **Gaffner.** Again, it's a computer industry term where they take a personal computer and they devise a software package for it that does a certain application, like they handle problems in a medical office, or that you might have—in your Congressional office. You might have a software systems house come in and devise software for it. But it's not a very important part of the problem you face.

It's really tailored software packages, is a systems house.

Audience. Okay. The next two arrows—I think this is minor, but the distributors in retail stores are a part of the same channel.

Mr. **Gaffner**. Distributors refer to wholesalers. The wholesalers who take it from the manufacturer and then move it to the point where the retail stores take over. They're part of the same channel.

Audience. Okay. And what is this ambiguous term over on the right, emerging——

Mr. **Gaffner**. Well, they have Tupperware parties where the ladies will go out and sell it locally. Where Chase Bank is now selling software of all types to users in their home. And E.F. Hutton, the stockbroker, they're selling four different types of—their registered representatives are selling four different types of personal computers and the software to go along with it.

These channels are just coming out everywhere, because everybody believes that books used to play the primary role, or network television that, more and more, in five years that PC software will be an increasingly important aspect of our lives.

So. Done with PCs, let's go on with—when we're done here today, one of the areas we're going to look at is the video area, broadcast, cable, satellite, home information, home entertainment information systems.

Okay, so again, you're going to hear about a lot of different technologies. You've heard about them, it's not too important, I think, to learn about what each of them means. They're all competing and will eat up each other as time goes on, and they'll all take away broadcasting.

And here's another way of looking at it. Why go through and tell you what all those acronyms are. You can read about them in all the publications in the trade. But they all enable a video program, largely, let's think of entertainment, or Plato software. These are all ways that you can move this creative video, the software you have to concern yourself with over here to the user. Don't get caught up in the turmoil in between.

Broadcast satellite, which the journalists love, which we happen to think is not going very far very fast. And the other two are also just transient technologies, multipoint distribution system and subscription TV. They're here for awhile, but they won't be that important.

But again, the problem with learning what one of them is, is that it can be gone. Yes, sir.

Mr. **Kastenmeier**. Following up on that, I do think it is important, not that you should take time at this point to explain. But I will say that members of Congress, whether they're members of the Commerce Committee or our committee on intellectual property, you need to know what each one of those—the theory behind each one of those. Because they are all part of various legislative proposals one way or the other.

And it isn't enough to say that we should be interested primarily in creation of material. We also have to learn about all the rest, the method and the usage. In this connection, may I advert to earlier—you mentioned the term convergence, even as the last slide devoted itself to multiple channel distribution.

Is this an example of convergence, that is to say, where you have multiple—multiplying methods that converge on a single—ultimately single terminal, whether that is a television set or a personal home computer? Or what is the term convergence?

Mr. **Gaffner**. Okay, first point. It's very important; the boss has spoken. So take these 48 hours to learn those. I was trying to be somewhat simplistic, and I apologize for that. And I'm glad you spoke up, because that's why you have all these demos here.

So God bless you, if you can learn all of these, I think it's terrific. All I was trying to say is, if you only have—and sometimes, I know there are some five or ten people that are going to be responsible for these laws that weren't able to make it to this symposium, they're going to have an even harder time. If you can only focus some time, I meant, look at both ends of it and don't get too caught up in the middle.

But thank you for correcting that point.

Now, convergence, this really shows a variety of different types of video distribution systems that the user, when it comes out as Star Wars on his screen, are—could all be done the same way. In other words, Star Wars could really be delivered in any of those ways to the user's screen.

So it just shows the variety of different delivery systems that you have to contend with. And I will now refrain from saying, don't learn them. But that you've got to try and learn. And that of these, at any one time, I guess what's important is to, at any one month—because it's not only a year. You have to know which ones are the two or three most important ones to concentrate on, okay? Remember low power TV and all the talk in Washington, all the licenses. What if you had spent a few hours a day learning what LPTV is and it's gone nowhere? I don't know how much time you have to look at them.

Audience. Well, I know that you cannot possibly devote yourself to an explanation of each, and that wasn't the purpose. But it is the case that each of these commonly is the subject of some sort of Congressional inquiry at some point in time.

Mr. Gaffner. Yeah, and lobby groups. I know, it's tough. So I think, as much as possible, learn them.

Now, what is convergence? Convergence is usually taught, when you have the computer industry coming from here, the TV industry coming at it from here, the consumer electronic industry from here, all aimed at providing the same type of application to the user, and then all coming together at the TV set, and a variety of technologies are accomplishing the same thing.

Like, take videotext which we've heard about, delivering text information over the screen. Much of that has been the rug pulled out from under because the personal computer came along and delivered the same thing in software. So now, today, you look at somebody selling a videotext system, and you see a piece of PC software that isn't even—and they look like they're doing the same thing for you.

That's the convergence of all these technologies that's occurring.

Mr. Hartigan. Haynes, John Hartigan from Sony. I was just going to suggest that you might want to redesign your slides slightly in the area of video cassettes, video disks, because they are not only part of the delivery system, but they're the end product.

Mr. Gaffner. Right. You could do that.

Audience. Can I ask a question? Is the point of this the transience and ephemeral nature of these different intermediate technologies? I'm not quite clear what the main point is on these particular slides.

Mr. Gaffner. Okay, one of the ways to look at it is, there are a number of ways to skin a cat. That's all it's saying.

Now, what are the implications of that? There's only so much capital in America that can be invested in each of these new technologies. So the ones that get the most capital are liable to be the ones that are—that you hear about the most. It doesn't necessarily mean that they do the best job of delivering Star Wars to the consumer at the best price.

Another point is that with so many different ways of skinning a cat, you are going to have a number of these that are transient and that will discontinue. Because first, you had MBS and then you had multichannel MBS, and it just goes on and on and on.

And to follow these and try and figure out where they're going to—what they're going to accomplish becomes a very difficult task. So in a sense I'm agreeing with the whole purpose of this 48 hours, and this is intended to show the complexity of what you face.

And one of the problems, I would submit, is that if you take the time to learn each technology and as you're about to maybe pass a law—I don't know how laws are passed, and then a new technology came out to which you were going to go in and talk about it, that changed everything, where are you going to be?

So that, I think that too much focus on the individual channels can destroy the concept of what you have to aim yourselves toward. But again, I'm not a policymaker at all; I'm only speaking from a commercial viewpoint.

Yes, sir.

Audience. I think, following up on Congressman Kastenmeier, why it's important to look at the different technologies, and what you mean by convergence, I've understood it in a slightly different way.

For example, you can't simply think of the telephone as a voice—a telephone can also deliver a TV signal or it can deliver text. And the same thing can be said for a cable. It can deliver text, it can deliver different kinds of applications. That's what we mean by convergence.

The reason why Congress has to focus on the convergence is that each of those areas are regulated in a different way. Publishing is regulated one way, yet if the telephone is publishing and is being regulated by the government in another way, as common carrier, convergence is destroying the regulatory boundaries and the way that public policy has been built around these different mediums.

And the second reason why you have to understand this area in the middle is that, copyright, just in the area of copyright, while you're trying to protect the intellectual property over here, many of the economic forces in the middle here are owners of the software program. There's a convergence of ownership across this spectrum.

So there are a lot of questions about when you offer copyright protection, you're giving control. Are you giving control to the author or are you giving control to network television or a cable system?

Mr. **Gaffner**. I think your point is very well taken, and it's the problem of trying to do an overview. And probably I should just stick to doing the overview and not make any points about what's trying to be done with the overview.

The main reason that you have the 48 hours, and that after I'm finished, you go on to the hands-on demonstrations in each of these areas, is to accomplish exactly what you wanted. And Congressman Kastenmeier wanted, and that is, to be sure that you do understand these as much as possible.

My job though is to provide a few simple guidelines to some people as to the relative importance of some of this field. Because with 35 people at LINK, we certainly can't keep up with it all ourselves, and we spend a hundred percent of our time on it.

So that's the only point I'm trying to make, is that a few simple guidelines, but that, yes, you have to learn these. And that's why you're all here.

Audience. I think you have another problem as well. Since we're dealing in an area now trying to define computer crime. And we have some statutes on the books, both at the federal and state levels, which computers have been identified. That technology is only a few years old, and yet the computer crime statutes don't apply any longer to much of the new technology. And we are now searching for ways to legally define what a computer is.

Now, you talk about personal computers, you're talking about the delivery of text and other things, where if you're using those computers are basically arithmetic devices.

Mr. **Gaffner**. Right.

Audience. And it's a whole new ballgame. And unless you can anticipate to some degree all of the various technologies which are coming on line, and talking in broad general terms, and describe as much as you can under the umbrella of the law, what will happen is, the new technology will come along, not fit precisely according to some court, in the definition of what you've done. And you have a whole new aspect to go back and change the law with, again.

And that's what we're facing now.

Mr. **Gaffner**. Thank you. I must say in that regard that I found again, the yellow publication of David Ladd—was that sent out to everybody, Michael?

What he tries to say there, and correct me if I'm wrong, but he tries to say we must transcend these various changing technologies into a solution to this problem, that won't have to have happen what you describe.

And I would hope that might be distributed. Granted that the whole piece is important to these people, because it was written for a different body. But the part that talks about the problems that I'm discussing, and how you have to transcend that in a solution so you don't keep having to go back and look at a new technology, I think is very important.

And that's really probably all I'm trying to say. But I will move on.

These are various video software services that are created. These are pieces of intellectual property. There's a great amount of innovation going into this area. However, remember that much of this was talked about four or five years ago before the PC software industy even started. So the video software industry, all that original programming for cable never really happened. Maybe one of the reasons is that PC came in so fast and grew so rapidly, and that the VCR machine is primarily used to look at movies that you rent at the local store.

Anyway, this is still an industry that you have to consider, and it will keep growing. These are some of the types of suppliers of video software.

Now, again, notice the common characteristics, when we get into video software. Very similar to the chart I showed you on the personal computer software. And even though we've talking here primarily about physicial distribution of this software for people to use in there VCR, it's also—video software is also of course broadcast over cable systems and network.

Yes.

Audience. I think you said earlier on that the physical distribution methods have been more successful than the electronic distribution methods in both video and personal computer software. Do you anticipate that that trend will continue?

Mr. **Gaffner**. That's a very good question. It really hinges very much on the problem you people face. And what has happened is that because of the success of the distribution physically of video and personal computer software, people have come up with new ways to download it.

Now, these ways of downloading it become a new type of mass piracy. And that's really the success of it.

Audience. Can I interrupt just to ask what you mean by downloading? That's something I don't have any idea what you've talking about.

Mr. **Gaffner**. Thank you very much. [Laughter.]

Michael? Michael left, but David, I might run a little longer, but I think that some of this does help set the stage for the 48 hours, I would hope. And if anybody disagrees with my definitions who are people are here to help us define these matters, tell me.

But in a simple term, if Star Wars is shown on NBC as a movie, and you record it on your VCR, in a sense it's been downloaded to your VCR. That's one simple way of—in fact it's a new term. Okay, you recorded it, but it's been downloaded.

Audience. It then is synonymous with copying?

Mr. **Gaffner**. Yes, yes, yes. [Laughter.]

Audience. Why then do we use different terms?

Mr. **Gaffner**. Okay. The same reason that the term downloaded has come up is that copying, as I gave a simple definition—but now you have two commerical schemes, whereby two people will get hold of a piece of software, either video or personal computer. And then through a pricing arrangement with a person who has the VCR device with a decoder, or a personal computer with a decoder, they will download it on a one time basis. And a fee arrangement is involved in it.

This has great danger to hurting the people who created the intellectual property, unless their rights are respected vis a vis the people who are doing the downloading. This is also true in the data base field, where you now have a personal computer, you can sign on to a data base and instead of paying the normal royalties, you can pull that data base down onto your personal computer and store it locally. Use it as you wish locally without paying the royalties.

Chris, do you want to say something?

Mr. **Burns**. No. My name is Chris Burns, and I hope this mike is working.

Mr. **Gaffner**. Yes, it is.

Mr. **Burns**. The downloading phrase really applies to the people who sign on to a data base. If you think of a data base of all the soft places of the last five years, and you sign on for 50 dollars an hour, you can get your stock prices or the changing current values for any sector of the economy. What some people do is conduct a search of that data base, and normally, the data base publisher expects you to be looking at this data on the screen as it responds to your search.

But what downloaders do is record the data as it comes over the screen. They record it into their own private data base so that the next time they want to search the data base, they don't have to sign on again.

Audience. What does downloading add to the concept of copying? It seems to me it would be more intelligible if we use that word, isn't it?

Mr. **Gaffner**. Well, it is—copying is done on a mass basis, and downloading is generally done on a kind of a point to point basis. That is, somebody has an arrangement and then it is released, and a monthly fee is paid.

But I agree totally with what Chris just said, that it is broader than that also, because it happens in the video software field, in the new ABC telefirst project in Chicago, which is the first time you have—wait, IDAC, right, is going to talk about downloading also of software.

Mr. **Leonard**. It's basically putting enough intelligence in the receiving unit, where the actual copying occurs, and where the reproduction occurs, so that you can begin to get legislative control of it.

Mr. **Gaffner**. Gene, good point. Gene is going to be in the whole demonstration on downloading here at IDAC. And virtually every one of the demos that you will see today can do a certain amount of downloading.

But remember, it is more than copying, because it has to do with the pricing arrangements. Copying, you usually think of doing free. But this, there is definitely a pricing arrangement. And the problem isn't getting the money from the person organization that's downloading, to getting that money into the hands of the creator of the intellectual poverty.

Audience. Can I just say, I think some of us are confused, but I think that downloading may be slightly different than copying, in the sense that you pay for the right to have this brought up on your own personal screen.

Mr. **Gaffner**. Yes, thank you.

Audience. At that point in time, you have it there. You have in effect copied it. When you bring it into your own data base on a permanent basis, you really still haven't copied it because it already was there. It's a very legal technicality which prevents us from enforcing some of our laws.

Mr. **Gaffner**. You're right, you're right.

Audience. You still haven't copied it, because it was sent to you legally.

Mr. **Gaffner**. Yes.

AUDIENCE. You've just retained it. Rather than copying it, you haven't reproduced it, you've just retained it. Now, the situation occurs that when you reuse it again, all you transmit that simultaneously or thereafter to somebody who uses it off your base, you copied it. That is really—and I think downloading presupposes secondary use—I'm sorry, copying presupposes a secondary use or the simultaneous rebroadcast somewhere else, whereas downloading in essence is the taking of that material which was sent to you appropriately, and keeping it, instead of just shutting it off and having a blank screen, theoretically then returning it back to the original sender.

That's what I think——

AUDIENCE. I apologize for having asked the question. [Laughter.]

Mr. GAFFNER. It's one of the areas that comes up. I don't care if you're involved in a group of people who spend all of their careers in the industry. This is constantly today having to be defined. So I think you were very correct in asking it now, because you will hear a lot about it in the next 48 hours.

But the worst aspect of it is, it's going to be one of the complexities or toughest areas that you face in your reasoning.

AUDIENCE. But we have to stop thinking about the prior contact between a publisher and an ultimate user. And we have to assume that electronics and what not gives us the capability of arranging individual relationships, contractual relationships, which can be monitored.

Mr. GAFFNER. Toni?

Ms. BERMAN. I'm Toni Beaman from the National Commission. One of the important points about the difference between downloading and copying is the type of use made of downloaded files. In many cases, they are integrated with other information that maybe we put into different numeric data, that may be integrated with reprint files that the individual has. But they're used frequently more than one time, and integrated with personal data bases as well.

So I think it's another dimension of the complexity.

Mr. GAFFNER. Thank you. And you'll have a lot of chance to learn more about that in the demos. I'm just going to give you a couple of forecasts.

This just shows that the video cassette recorder has to be one of the most exciting new devices ever created for the use of individuals. It almost should have that same glorious definition that I gave earlier about the personal computer: it really does change the way of life in a family, if you think about it in your own home.

And it will continue to grow. I think its growth is in the early stages.

Mr. MCIRVINE. I'd like just to break in here to follow up on that most recent remark. This is Ted McIrvine from Xerox.

The one element that looms large, I think, in the aspect of copyrights that hasn't been touched on, and that is not only protection of the rights of an author in terms of compensation, but also the rights of the author in terms of the protection of the integrity of that which he has created.

And the reference that was just made about the use of downloaded material I think touches right on this. That is, anything that is provided in an electronic medium is therefore subject much more easily to modification, and by that modification perhaps a dilution of what the author originally intended.

That's another aspect of the copyright problem.

Mr. GAFFNER. I can see two years from now having a symposium alone on downloading. That's a problem, because it does transcend both data bases, it's in the soft in virtually all of these areas. And your question earlier about—about the problems of physical—the future of physical delivery started this.

The easy answer to that would have been, yes, physical delivery will grow increasingly, along with communications. However, it's this downloading that could affect that. Guess we better move on.

This just shows some of the VCR companies. Now, we've heard enough about the VCR. This is an older survey but we don't think this has changed very much. If you look at the main use of the video cassette recorder, it's still what they call time switch. That is, for the convenience of the family, these ratios haven't changed very much over the years. I know this has been brought out in all the Betamax talk.

The disk, we will see some of it.

Okay, but that other one, it's only point was that it really—okay, I'll leave it on. I just concluded this slide because of the Sony case. These ratios pretty much hold up. And that will be included in the slides that we send to you.

You hear a lot about the video disk. We'll hear about the disk being used as a storage device this afternoon.

In the entertainment area, the disk has been unfortunately not as successful at all as people had anticipated. We're going to hear also this morning about compact disks or digital audio, a very exciting new development in the recreation of music using a lot of the same technology that comes out of the video disk.

Audience. Can I ask a question? Video disk recorder is one of the bigger bombs of the electronic industry over the last few years. But now with the advent of—what do they call that, video rock or those—

Mr. Gaffner. MTV's.

Audience. MTV and whatever, now they're putting them on the disc, are generally tended to be cheaper than tape.

Do you foresee those disk players coming back?

Mr. Gaffner. No. I see the MTV type of video rock being still more on some type of a cassette delivery, because there's not enough disk players. Here's our forecast. The bottom one shows the growth of disk players. There are just not enough disk players out there to make it worthwhile for the software producers to put it in disk form. So it will be more in cassette form.

This shows your—the yellow is the TV home, and you can see, rather slow growth really, when you think about it, the blue being the cable converter in the home, and the much more rapid growth of the VCR device, and little growth in the disk.

Audience. Is the quality better on the disk than it is on the tape?

Mr. Gaffner. Today. But with all the money being made by the companies in the tape area, it's being put back into technology, and that will continue to improve. We're going to hear a compact disk. But one of the reasons they say the compact disk may be ready is because of the Walkman. Just follows Dr. Boorstin's comments about the cumulative effect.

We all had stereo in our home. And then along came the Walkman and we all listened to it like this, and so we now upgraded our expectations for what we want to hear. And now that paves the way for compact disk, which we're going to hear about.

So I think that the cassette will continue to improve.

So the main point here—yes, please.

Audience. I'd just like to make two quick observations about the disk. One is that it's growing at a very high rate, as you can see on your graph. About the same as video cassettes, a little bit less, approximately three times over that same period.

Second of all, it's now being connected to the personal computer. And when thought of in applications as a peripheral device, and a storage medium for digital information as well as video, I think you're going to see a big change in that point of view that was just taken about the lack of success of the disc.

Mr. Gaffner. Lack of success of the disk, like he said, is primarily aimed at the RCA disk effort and the Pioneer. Those have not paid off. We're seeing new applications of the disk this afternoon and in the demos here.

This effectively shows the problems cable has and the relatively slow growth ahead, albeit it's still one of the great successful industries if you look over the 50 years in America. But it is being impacted by these other technologies.

These of course are some of the leading cable system owners. We have a variety of methods for delivery of cable, and we're going to be getting into satellite shortly. And remember that cable is a transmission system as opposed to a creator of the software.

Audience. I don't understand that. What are you trying to show us? The various kinds of input in the CATV systems as a source of programming?

Mr. Gaffner. The various ways that the cable head end can receive programming to play to the user the cable system being, again, getting back to the national versus the local delivery system.

Again, the point on cable is that we hear so much about cable. It is a transmission system, it is not the ultimate equipment device, nor is it involved in the production of the software.

Audience. Okay, but on the lower lefthard side where you have cable syndicator, what do you mean there? Cable networks? Like CNN?

Mr. Gaffner. Yes.

Audience. And right below that, what do you mean by U.S. Mail, that you mail prints?

Mr. Gaffner. Or that you can mail a videocassette to a local player. It's just various ways that the cable companies get their programming.

But the big breakthrough was in '74, of course, when the satellite came along. The satellite is what really sparked a whole range of new developments in the cable arena, and that's what brought about all of these various pay services.

But remember, the satellite as you hear about it is a national or international delivery system which then is fed into local delivery systems. But it's changed the whole dimensions of the copyright and technology problems, and made cable the industry that it is today, and created all of these new types of networks, that bring you a variety of programminng on a national basis. And in effect, these networks compete very much with the VCR programming, the disk programming. They're part of the same spectrum.

Audience. Wait a minute, go back to this. What is the difference between paying units and paying households?

Mr. Gaffner. I can give you an answer, but I think we've got one of the world experts in all of this, who helped created it with us. So, Gus, why don't you give the answer to that?

Mr. Hauser. Yes, the distinction is between households taking one pay service and those taking more than one pay service. And the cumulative effect of that in paid units, so that some households may take one or two pay units and some only one.

Audience. So if I'm taking at home Cinemax and HBO——

Mr. Hauser. You've got two units.

Audience. You count that as two units, right?

Mr. Hauser. Right.

Audience. I was interested in your comment that cable was growing slowly. I think maybe it's growing as fast as the cable operators can physically connect the customers, at a rate of about 350,000 to 400,000 subscribers a month.

And knowing the industry regards that as slow. They're having their teething problems in accomplishing that phenomenal growth as it is.

Mr. Gaffner. There's no doubt about it. The cable industry by definition with the heavy infrastructure that has to be laid is not one that can grow possibly as fast as one like the personal computer industry that came from nowhere in three years and became the type of industry that it is.

The cable industry is something that will continue to grow through the rest of this century, and increasingly play an important part in our life, no doubt about it. This does show that the——

Audience. Can I follow up on that?

Mr. Gaffner. Yes.

Audience. Isn't there a very big problem now because although the growth is going as fast as they can lay cables, isn't it a reality that with the advent of the satellite transmission, the ultimate necessity for cable TV is slowly reduced? Because many people in concert—for instance, right here in this area, new construction by home builders or condominium builders can in fact allow for the investment of sufficient capital to buy an earth station, bring down from satellite that which would have been provided by cable. And the people building the condomiums or large tract housing can in effect run their own companies. They no longer need cable to deliver the same services they can now get off the satellite by a small investment for an earth station, and wiring directly in their own complex.

Mr. Gaffner. Right. That's called SMAT-V or SMAT TV or satellite master antenna TV. I'll have a slide on it in just a moment.

Audience. That's depressing ultimately the——

Mr. Gaffner. Well, that is one of several technologies. LINK feel strongly that the cable industry—and Gus won't agree, probably, but this is why we're all here in this 48 hours is that the cable industry underestimated the impact of the videocassette recorder. I think once you buy a VCR in the home, there's less need any longer to have a cable set in your home.

And that's a very simplistic statement, but that's probably hurt the growth of cable more than all of the other competing technologies all along. And I point that out because again, the videocassette is a stand-alone device. It's a lot cheaper to run, you're not having to hook up cables. And after all, they're now experimenting with downloading over broadcast directly to your videocassette recorder without having to lay a cable.

But it is—you're right, there's a number of technologies that came along because of the cumulative effect Dr. Boorstin mentioned earlier.

Audience. I would just comment in broad perspective on that issue that after you look at all the competing technologies, and there are many, whether it's SMATV, satellite master antenna system or VCR or direct broadcast satellite, I think those in the cable industry feel very strongly that cable will compete very handsomely with all of the technolgies, because after all it is the most efficient and most effective and widespread delivery system for information of all kinds.

I'll skip the details of all that.

Mr. Gaffner. Right, and Gus will be on a panel tomorrow and he will be here—he's one of the pioneers in that industry for us to talk to during dinner, et cetera.

I'm going to go very fast. I'm going to have to wind up in two minutes. We are negative basically on the growth of direct broadcast satellite that you hear so much about. When you take all of the available market we see going way over to the right that there's only about seven percent of TV households in America that really become a viable user of direct broadcast satellite, despite all of the talk and billions of dollars that's going into it.

This is what our gentleman here talked about on an SMATV. This is a very good description of how he just described apartment houses can eat away at the local cable systems.

But cable systems in Virginia, where Media General is wiring Fairfax County, they're now going into this same business and are wiring apartment houses as part of their installation within a whole community. So I think the cable industry is overcoming that.

AUDIENCE. Speaking about apartment complexes, et cetera, the owners of the real property are refusing easement to lay the wire, because they want to run their own SMATV. And this is a situation that they anticipated [inaudible] and pay franchise fees and develop the areas, based on this. And now they're being hit with this kind of competition that they never anticipated. Now they're asking for relief.

Mr. GAFFNER. Right.

AUDIENCE. And it looks to me like this is a real case of unfair competition based upon the failure of an industry maybe even to physically anticipate.

Mr. GAFFNER. I totally agree with the problem. I'd rather not get into a discussion of it. I think it's very difficult, but hopefully during the course of the 48 hours we can get into more detail on that. And I would think tomorrow you would find the panel has to address themselves to your point. Very good point. And those are powerful lobby groups working on you, I know how it is.

Local cable systems are all coming together also, which makes it even more complex. I won't get into that, it's called cable interconnects.

This is kind of an overview then about the problem, as I come to a conclusion here on these various technologies, based on what cable faces today.

AUDIENCE What is Telco competition?

Mr. GAFFNER. Telephone companies. I have a whole area that I'm going to skip. But one of the biggest problems we face, we don't all have to have one more time of Timothy Wirth and all of the battle over the last three of four years and the AT&T divestitute, you've heard enough about it.

But it has a major impact on this field that makes it even more complex because those individual seven companies plus AT&T are very, very powerful companies with a lot of clout, money, brains, technology, and they're going to be in fighting in this whole arena. And we just haven't even begun to hear about them yet.

But that's going to be—the telco's being another threat to the cable companies. Some of them are even trying to get into the cable business.

This slide simply goes back to that one simple rule of thinking about the local versus national distribution, and the local being the telephone lines and the coaxial cables and the national ways of distribution being satellite, microwave and fiber.

So I'm going to—as we look at that slide—now, this is a good slide to end on. That shows again the complexity that you have in these new communication arenas. This also shows the intercity or national that are involved, and the local loops.

And most of these technologies are either in one of those areas or another. That's another basic principle. And so I'd like to, as we look at this slide, just review again what sometimes has been a rather haphazard presentation, and it is far too simplistic for the complex decision making ahead for you.

Just the six points again, one of them being, make sure you understand the geographic mix of national versus local. It has a lot to do with how you look at each technology, that you basically are focusing on the software production, and in the middle areas you're looking at turmoil in the means of distribution and in the terminal device, the access device.

That's where the turmoil is going on, and where you have to keep track of each of those on their own. But as you do that, don't look at any one technology on its own. You have to see it as part of this whole mix of the new electronic media. And the final point then is that the convergence of all these technologies, and that convergence is often transparent. There's another complex point that you have to keep in mind, because many of the forces at work are aiming toward the same goals which converge in, say, one type of presentation on your screen.

Do you have a point? Yes.

AUDIENCE. Are these slides you've shown available in printed form?

Mr. GAFFNER. Not today, but I will be supplying them to David Ladd, and he will then send them on to the participants; he will know who they are. But at the same time, if any of you have a business card that you could give to me during the next two days, I will make sure that we mail those directly to you if you have that need. Just give that to me.

So in conclusion, on the convergence again, that's why we are all here. That's why we've converged for this 48 hours, is to come away with more than we came with and try to cut through some of this. And I hope that this is only an initiation of that process, this presentation this morning, and that as we go now into the hands-on demonstration by the various companies who have been kind enough to come here, that we will clear up even more of the confusion which addresses this whole field.

Thank you.

The first presenter will be Don Devine from Trilog.

Mr. DEVINE. Good morning, folks. The most valuable piece of intellectual property I own is my good name. Since coming here, a number of staffers have pointed out to me that there may perhaps be someone at OPM who is tarnishing my image slightly. [Laughter.]

In any event, I'm totally unrelated to that other Don Devine, and hopefully you will remember who I am.

We're going to do a demonstration that relates to computer programs. Now, that's the kind of software which is a little different than some other software that we've been talking about here this morning, in that it's aimed not at human beings, not to educate or not to please a human being, but it's aimed at instructing a computer, a machine, in how to do work. That work might be to run a game or it might be to run a spread sheet or do an accounting system. But yet, it's work.

And so the key item here is the computer software is an engine for improving productivity in America. The computers are worthless without the software. And it may be one of the most important things for us to face up to, how are we going to make computers able to help us improve productivity in America in the next decade.

In order to do that, we're going to have to make sure the people are profitably rewarded and encouraged to build computer software, which means they need a certain amount of protection.

If any of you have children who are 11 or 12 or 13 years old, who have nieces or nephews or grandchildren, there is probably someone in your family actively engaged in software piracy.

Now, that may sound like a terrible indictment. I'm a leader of a Boy Scout troop, and after the Scout meeting one night, I saw these boys over in a corner, and getting together, having a little bull session, talking to each other. And I went over and said, George, what's going on? And they were passing diskettes back and forth. And I asked what was happening. And they said, well, Charlie here, he has all of the latest games for his Apple computer, and we all have Apple computers at home. So every week we give him a couple of blank diskettes and he copies those games for us.

This is an interesting dilemma for a Scoutmaster. [Laughter.]

It's an interesting dilemma for a Senator or a member of the House of Representatives who might find his own children or grandchildren or nieces or nephews illegally copying software.

The Betamax decision may have indicated that this is acceptable behavior if it takes place in the home. We are going to show you how easy it is to copy software, including that software in which the manufacturer has invested heavily to keep you from being able to copy the software. We're going to show you how you can go to a local computer store and buy a product for 50 dollars which will let you break the copy protection of almost any piece of software that exists.

We're going to show you a piece of software today, and we'll let you actually sit down at a computer and run it yourself, a piece of software that says, if we can't crack the code of some product that you bought, send it to us, we'll crack it and send it back to you within 30 days.

This is a serious problem of what is acceptable behavior. I'm concerned with it in the home. I'm more concerned with it in business, in the universities, in government, everywhere we're looking at productivity tools, we're looking at improvements in American productivity, and we're looking at building in America an outlook today which says it is acceptable behavior, piracy of software. When these guys move on and they start working for the big companies of America, they're going to continue to pirate software. So it's a major concern.

What we're going to do is, we're going to show you how it works and we'll be talking more about it in one of the panel discussions tomorrow.

Mr. Gaffner. I've been asked again by the people running the system, if you have questions to identify yourself, because apparently the questions aren't being captured.

Our next speaker, or at least to introduce Bill Tauskey from Visicorp. Is Bill here? He's probably back in the demo room, because Visicorp is one of the early pioneers in the building of personal computer software or the publishing of it. Visicorp now has a whole range of software on the market. And as you can see, his demonstration is going to be very useful in that regard, and a better understanding of the copying problem that a publisher of software faces.

I think that most people feel that the P.C. industry really started about four or five years ago, when the Apple computer came out along with Visicalc, which was the financial spread sheet, which was pioneered by Visicorp.

Next then is Pat Wilson from North American Phillips, one of the leaders in this whole area of home entertainment information centers. Pat?

Mr. Wilson. Just a quick rundown of what we're going to show and so forth. Before I do that, I think it's important to—before we tell you where we're at, is to just review quickly where consumer electronics has come from.

I think of the 20s, 30s, and 40s as the age of radio, the 50s as the age of black and white television, the 60s with the age of audio, the 70s is the age of video, video cassette recorders, solid state color television, the 80s, digital age emerges and the 90s, solid state digital recording, which is what we see coming.

Also, it's proper to say that all our companies are looking at the computer in the home, working at the marriage of the computer and the TV. I say the TV, but what I'm really saying is the audio video wall that we're going to demonstrate shortly after this meeting, and coming together with the computer. Those three items, we think, and we're working on, are going to change drastically the quality of life that we all see in our own homes.

Just looking back, the chunks of time, those decades when we measured progress [illegible]

Our marketing people say that if you blew this—the pits that are encoded on just one side, if you blew it up the size of a football field, each pit would still be no larger than a grain of rice. Now, our colleague from Sony mentioned to us last night that every man, woman and child in the United States, their home address could be covered on a disk.

We'll be showing this and we'll let you play it and feel it and plate. Also, one of the things in 1983 are the high performance contact projection TV, which we'll show, liquid pool and so forth. Other developments in 1983 are these new cam corders, which are the combination VCR and cameras in one. I guess you might remember where Kodak introduced an 8-millimeter. There's also a Beta movie and another one, a VHF hifi which is coming on, and a VHS video movie.

In 1984 we see a whole generation of new picture tubes coming on that are going to change the look of the TV set. Projection TVs are going to change drastically and will be better than color TVs. Digital TV, digital everything is coming in 1984 and 1985.

I guess having had a little background in the commercial side of industry electronics, we used to talk in terms of the rate of change. I think today it's the rate of the rate of change. We've seen just by running through the background that things used to take decades, then they took years. Now they're taking months and we're seeing weeks.

And we've had examples where a product was introduced, and before it was actually in the marketplace it was obsolete. And that's the kind of things that we're seeing. In consumer electonics, I think we used to be at the tail end. We used to be the caboose of the train, and now we're no longer that. Technology has helped us come right straight from the R&D lab, right into the consumer field. We don't have to wait til industry gets ahold of it. It just doesn't happen that way anymore. It's occurring very, very rapidly.

And my colleague, Rich Hoetjer will be demonstrating the products, in the board room, Rich? In the boardroom down next to the G&C rooms. And if we can answer any questions at that time we'd be glad to. And if you'd like to come up and try any of the units yourself, you're more than welcome.

Mr. Gaffner. Those three gentlemen represented, as you can see on the chart, the home computer and electonic entertainment section. The second arena is broadcast cable and satellite, and I'd like to introduce first John Sabio from SAT TECU. We saw the large type of satellite dish receivers in one of the slides. These come at various sizes all the way down to those tiny ones that will go in the home. Here's John.

Mr. Sabio. Distinguished guests of honor, Congress, ladies and gentlemen. Due to remarkable advances in communication and recent laws, we have about 300 channels of television programming available to us, direct from satellite. With 100 channels 24 hours a day. That is, television programming, computer data, 150 radio stations, and telecommunications. I'd like to point out, a lot of hotels are getting into teleconferencing.

We have educational channels, music channels, sports networks, religious channels. There are four hospital networks now, most of the hospitals locally are getting into teleconferencing, and inhouse hospital networks for inhouse education.

We also do satellite master antenna systems for condominiums, where we install the complete system free of charge to the owners, and just become programming brokers. For example, we pay Home Box Office their royalties per month, on a unit basis.

I know at my home, I have cable and Home Box Office charges me approximately ten dollars per month for Home Box Office. That's paid through my cable company.

When we offer a system to a condominium, the unit owner would pay perhaps $5.75 to us per month. Of that $5.75 three dollars goes to Home Box Office, and the [illegible] would go to cover the expenses of installing the equipment.

[illegible] a lot of foreign trade [illegible] and will pay any royalties [illegible] us actually show the rest of [illegible] should make it legal for the rest of the world to use our satellite [illegible]

Thank you.

Mr. Gaffner. John, being based through you, you are selling these satellite dishes here in the Miami area.

If any of you have been to the Caribbean during the winter, you'll see, as you go around some of those islands, they have a lot of these dishes.

Nobody is to blame in this, I'm not suggesting. But that's one of the problems that I've seen mentioned as you look at the copyright aspects. And a friend of mine in British television was hired by the Jamaican government to participate in the whole scale bringing in of the HBO and broadcasting it right out to all of Jamaica from the satellites that they installed at the national Jamaican TV, with no payment even going to HBO, much less to the original copyright producers. And you can imagine what that does to the sale of American movies exported to Jamaica.

Do you have any comments on those problems, since you have a firsthand view here, or not?

Right, right, come up later. Thank you, John.

John did remind me of one item I wanted to include in my introductory remarks. And that is that despite the problems that we face and the complexities in this, the American system has really been wonderful when it comes to having a climate for the creation of these technologies. We have a lot of European clients and Japanese clients. And believe me, they are way behind because of the lack of good copyright laws or the implementation of those laws.

If you look at all of this area of the new media, the Japanese and European developers of systems, all look at bringing their systems to America and testing it out in our marketplace. So that, despite the fact that sometimes you worry about our problems and not keeping up, you're way ahead of the rest of the world. And maybe it's because of symposiums like this.

The next speaker is Bob Quinn from the NABU network. Six or seven years ago, Bob and I were involved in our first venture in the new media, where we were helping to demonstrate one of the systems that we've talked about today. Bob has a long history in bringing new technology to the public.

Mr. Quinn. Thank you, Haynes, and good morning. Sometimes the people introduce you as bringing things to the public; it sounds a lot like pioneers. You all know the story about the pioneers, the people with the arrows in their back. I had a few in my back this morning. I'd been speaking this morning with Dr. Murphy, who's visited the demonstration room and doesn't want to leave. We will have a demonstration of what we're calling the NABU network after lunch. I'd like to tell you a few things about it this morning.

NABU is a company that in 1981 decided there was a business making communicating computers. The problem it sought to address was that the mass market was not buying personal computers essentially because of two problems. Number one, the box was expensive and required some technical expertise to run.

Worst case, once you understood the box, now you had to buy software. That was A, very expensive, B, at least bewildering to average Americans going to the computer store and saying, I would like a word processing package so that I can write my letters at home. It is never that simple a dialog, it's how much memory do you have, how fast do you want to run it, do you want to store it, do you want to put it on paper. And all of sudden, third sentence in the dialog, you've walked out of the store.

If you choose to stay, you spend a lot of money. Suffice it to say that the bottom line today, a typical American consumer who wants to buy a personal computer, can buy something off the shelf, a Commodore 64 computer routinely retails for less than 200 dollars today, and you have a box. It doesn't do anything, but you have a box.

You then go and buy the adapters that hook it into the telephone line, that's a 100 dollars. You can buy the storage devices, that's another 100 dollars. If you buy a printer you spend three more. Now you're ready to buy the software. Software runs anywhere 200 and 300 dollars, depending on the maker and what it does. That is not, I submit to you, a typical consumer purchase.

NABU's idea was, if we can eliminate all of the jargon, if we can eliminate the cost threshold at least get it down to the point where it's an acceptable level—that [illegible] may be a mass market and there's [illegible]

[illegible] One is what we call the [illegible] that have leased [illegible]

[illegible] require a video quality channel for distribution [illegible] in Alexandria during the week [illegible] channels of [illegible] programming.

Well, there are also a good half dozen other channels that are unsuitable for video. The NABU network can ride on those channels because it delivers digital signal.

So one, it's a head-in pump that passes the signal around the cable on a channel that the cable operator designates.

The second critical piece is what we call a NABU adaptor, which is a box that goes in the home, it translates the signal that it hears over the cable so that the personal computer can hear it and use it.

Coincidentally, it also has a return capability. That adaptor in the box can be plugged into your telephone wire, so that conceptually you can receive a signal through the cable system. That signal may be, would you like to find out what Dow Jones says about the NABU stock today? You say yes, and the adapter then automatically dials, because it's received telephone number and computer sign-on code from the cable system, automatically dial the Dow Jones computer in Princeton or any other remote computer. And now presents itself as another telephone subscriber to those remote data bases.

The third piece is the service itself, the software that is spun around the system. And that is virtually anything that the seller of the service may sell. I think the things that sell fall in five kinds of categories. Number one is educational software. There is a bewildering array of general software, education software by itself is monumental. There are zillions of titles, some of them educate well, others run well in computers, there is very rarely a good road map through that forest.

But there is certainly a high demand among municipal and state officials at least, who pay through the local school system for quality education, computer-assisted education, at least in the primary and secondary levels. In Virginia and North and

South Carolina, we're seeing a lot of activity on the community college level, where instead of adults going to a classroom once or twice a week for a class, you sign up for a class, you get a telephone modem and you get an Apple computer and you go home. The local cable service delivers software down to the computer, and the student sits there and takes the course.

For regulatory purposes, the state requirements, the student needs to meet periodically with the instructor so that there was in fact a class meeting. But the classroom activity happens in the computer system.

Number one is educational software. Another key ingredient is video games, simply because that's an enormous market. And it's the kind of software that's easily distributed, has a relatively short lifespan, so there's a constant demand for new titles. A simple hands-off delivery system seems to be effective for that.

Third is professional software, the reason most personal computer owners bought the box in the beginning. I'd like to do word processing in the home. I happen to have a financial orientation. It would be nice for me to do a spread sheet analysis without going into the office. A good Visicalc program is a 200 to 300 dollar buy. I could rent one for five bucks a month and use it as frequently as I wanted throughout the month without spending any more money. That would be a reasonable purchase for me.

But professional software is something that the makers of the hardware seem to think would be valuable. Next to the last is information, simply because as Haynes has indicated, I've been associated with the business for awhile. And today, there clearly is not a stand-alone business delivering information to the home electroncially. Maybe tomorrow, and maybe wedded with other kinds of services. But nobody is going to read the Washington Post or the Wall Street Journal off a television screen, when you can fold it up and read it in the car, and then tear it out and give it to your friends, and on Saturday afternoon wrap the fish in it. Nothing replaces that.

The fifth and clearly the most lucrative down the road of the services of the network offices are transaction services. Retailers today claim that they spend somewhere between 25 and 35 percent of their gross sales number in things like distribution, cost of sale overhead. Sears in their last quarterly statement said they weren't going to build any more major storage because it was no longer feasible to follow the segment population shifts. The cost of brick and mortar was just too expensive.

If you could offer transaction services, purchase of goods and services electronically. The retailers are certainly people in your ballpark. We've seen in the last two or three years that the banks and the financial services companies have really pushed that frontier a great deal. There's phone call Compucard, based in Stamford, Connecticut, that has some interesting financial links and investment opportunities. But their whole business is to offer high ticket items, 300 or 400 hundred dollars television sets, from national manufacturers at between 25 and 40 percent of the retail price to subscribers that come either over the telephone or some other electronic means, to their catalog clerks in Stamford.

The normal routine is to buy an 800 number, be identified as a subscriber to Compucard. The operator reads you the kind of televisions that are available today. We have a Quasar and it's 40 percent off. It will be delivered to you through UPS or whatever the normal foot brigade is in your neighborhood. And it will be serviced and guaranteed by the manufacturer as if you'd bought it in a local store.

The down side is, you can't go to Louie's television service who only sells RCA, and expect Louie to service it for you. It's the loyalty issue that always grows up. But in terms of a consumer buy, it seems to be an interesting opportunity for businesses.

Transaction services I put last because there isn't a compelling need now to provide those services. And the other side of the coin, to retailers seeing an opportunity. Every retailer I've ever met grew up watching people walk through the door for a Bandaid and selling them a pair of crutches or some toothpaste while they were in the store. And it's a whole new learned experience to find out how to deal with people electronically if you can't touch them.

I'm suggesting that there is a business selling four kinds of services electronically to the home. And NABU network has found an off the shelf way of simple—without inventing any new technology way to provide those services.

For the cable operator, you've all read in the last year and half about the financial squeeze a lot of the cable operators have been in, as we went to the enormous task of building the infrastructure for cable. Cable operators need ancillary income that has a very low cost threshold. If I can provide an income stream to the cable operator that does not rob him of a video quality channel, he's happy. If I can do it in a way that he doesn't have to spend a lot of money, hire a sales force, service the equipment, he's happier.

For the person who makes the software, the person who somewhere along the line held a copyright to that software, he's excited because there's a larger market now to sell that. But if the hardware manufacturer has not specified a particular kind of personal computer, the more software, the more demand there's going to be for the box—he's a happier person.

And all I want is a piece of the action for putting the translator or the actor in the home. Now, one of the problems we've encountered this morning is the frontiersman issue, having a demonstration unit that we last used about four months ago, to show the British what cable television was alike. And having lost the systemin Alexandria three weeks ago, I discovered this morning at 2:00 in the morning that three wires that routinely sit in the box aren't there. And we spent the last three hours trying to make one. I'm a banker by education, so you can imagine what success we had.

I can promise you two things. One is that after lunch we have a 60-40 probability of having a demonstration of the NABU network in the board room down at the end of the hall.

Failng that, should Professor Murphy still be among us, I would be more than happy to entertain any or all of you in Old Town for breakfast, lunch or dinner or a 30 minute go through the system, whatever you prefer. Frankly at any time that's convenient for you. We've handy to the Hill, and watching a demonstration system is fun, but seeing it live over a real cable system is somebody's home or in an office building is much better.

So I'd welcome you to do that. Thank you very much.

Mr. Gaffner. The last speaker for morning is Gene Leonard of VVR Associates. Remember, this was the gentleman on that troublesome term, downloading, who is one of the experts in this field.

Gene.

Mr. Leonard. The answer is, downloading is upstream. Despite all the confusion, the entrepreneurial—and the desirable confusion that is generated by all of our technology, there are still some technological information science basics that don't change.

And if there's going to be a legislation or any other kind of conclusions of reasonble longevity, they have to be based on what is possible, not only what is present. And they have to be based not on what Haines called the hype, but they have to be based on an understanding of what is behind the hype.

For the past two years, our group has been engaged in investigating the prerequisites—or the requisites, I guess is a better word for electronic telepublishing. And that really means determining the technological capability which can be economically appropriate to obtaining, distributing, monitoring, recording, and using those techniques to reward the creative person or the copyright owner.

I'm going to have to skip through this because we are running way behind.

What we have invoked are some very basic video computing and telecommunication tools in structuring. We've used these tools in structuring our system, and what we plan to distribute is audio materials, video materials, entertainment, merchandising, transactions, education, and general information.

Now, that sounds like just about everything. And in telepublishing we should be capable of distributing everything. And the truth about information technology is that by either analog or digital techniques, we can distribute anything.

There is nothing that is a field of information that cannot be generated, manipulated or in many, many ways handled by our magnificent tools. The only thing our magnificent tools can't do is think of a new idea or have a pun. Although I guess I'm getting into a controversial area with the artificial intelligence blokes. But if they're right, I'm afraid the copyright people are going to have to start writing rules about patent applications by computers.

I think however that's a lower priority problem than the problems you're facing now. Let me try slide one. As we see, the only slide.

What we have here is a condensed version of the various things Haines was talking about. There are a number of sources of all types of information which have commercial use. There are a number of mechanisms for delivering them, which I've chosen to categorize in different forms. Namely, the standard programming techniques which are the free channels, the pay channels, the pay for view channels.

Secondly is a whole wide variety of techniques that have to go through some basic clearinghouse, if they are going to be put in the form which will run over standard gauge technological tracks to get to the ultimate consumer in the home.

And at that clearinghouse there are a number of significant functions which clearly will require legislative impact one way or another in order to regulate them. And they are acquisitions, scheduling, remote control of delivery, auditing of viewing or use, and response.

This slide was prepared for a paper delivered to the Society of Motion Picture Television Engineers, which dealt with the impact that these requirements will have on standard television's technical standards, which have to change if we're to reach the goals that this kind of a system implies.

The methods of delivery have been well covered by Haynes. Those are those boxes down below—broadcast, various MBS, LPTV, et cetera. And of course cable. The one thing I've shown that hasn't been brought up before is the fact that there is not only a downloading, but there is an upstream. And the upstream is a technique which has to be implemented if we use all of the economic and commercial capabilities of our technology. The question is, when it is implemented, you've got some very serious privacy problems which have to be addressed.

But they do provide a way for rewarding the creative person for the use of his creative work. Let me take that off now.

It is not user friendly, talking about buzzwords.

These basic designs have involved a bunch of assumptions that I think are key to the understanding of any system. And I believe they can serve as guidelines in trying to control and understand the technology. We assume that a great deal of bidirectional telecommunication band will be available, combining telephone integrated with video facilities.

The emphasis on upstream in our case is primarily telephone. And that implies another couple of buzzwords. We prefer to operate in a batch mode wherever possible, rather than on line.

It was assumed that this band can carry information representing still pictures, motion pictures, textual information, control information and response information, all with equal facility. And therefore, video display can readily include all of these features, and a single display never has to be degraded in quality.

It was assumed that the two major telecommunications facilities were timesharing and storing forward which is really what we must begin to consider the VCR, not merely a time shifter, but something we like to call storing forward. It's a little more intricate.

These can be invoked to maximize individuality into activity. We assume that a portion of the information processing power must reside appropriately at the user's location, not merely the consumer—well, let's consider him the user, as part of a network with a central transmitter, processor and controller.

What has happened is that electronically mediated information techniques have changed the path of the creative product from the innovator to the consumer. Previously, centralized reproduction was followed by a distribution tree of physical objects. But now, reproduction and distribution can become integral, and more and more so as electronics takes over, do become integral, and instantaneous and universal, and they can occur in the consumer's home. Both distribution and reproduction.

Fortunately, many of society's other transactions are also moving into the home. And thus, the system and equipment course can be conceived as being appropriately distributed. But that in turn requires a series of standards which are initially technical, but which are eventually legislated, that must be constructed if we're going to avoid an electronic tower of Babel.

We assume that the system's distributing, processing and upstream power will allow the establishment of readily modifiable contractual agreements between the provider and the user, all mediated by the distribution system's operator. Knowledge of each use can be obtained by the system's operator, and given this information, it's up to the entrepreneur, the owner of the copyright material, to decide on what kind of a building scheme he's going to use.

We further assume that if the producers of desirable information are going to be rewarded, then we have to protect their product to whatevert extent is economically rational. And that this protection has to be provided as an integral part of the transmission and even the activity at the terminal.

We assume that the quality of presentation in all variations must match the commonly expected quality of the standard medium, and the standard medium is a good commercial underarm deodorant display. And we've got to match that if we're going to reach our market.

We assume that the extreme flexibility in operation and modification of this whole operation would be necessary, and therefore we need appropriate hardware and software design and downloading and upstream capabilities. We created an engineering prototype of the central computer and terminal, but they were too bulky to bring, and so we have a tape representing typical operation that's available for viewing and discussion, thanks to the pause control on the VCR.

Now we're going to move into an experimental operational phase, in which a number of factors will be explored. And these are the human behavioral requirements, the merchandising techniques, the reporting capabilities, the service of community interest, the dialog between representatives and constituents, First Amendment considerations, access roles, privacy concerns, and diversity of access and providers. And if anybody else can add anything more to that, go to it.

But underlying this, there has to be a study of the technical standards used for display, transmission, monitoring and control. And whatever our particular implementation has been, it is very likely that a series of industrywide standards will eventually be adopted. I had that experience in data transmission, 20 years ago, where some of you may remember a data transmission system, a digitronic system which had its own proprietary transmission scheme. And eventually the world caught up and replaced it. But it ran for 10, 15 years.

It is suggested that these standards will have a significant bearing on the eventual ability to meet legislative concerns on a number of levels, and in a number of areas, including those of copyright. Without these standards by the way, and without these basic underlying facts of technological and information life, what Haynes calls convergence could never have occurred.

It is not clear which combination of administrative and legislative entities in the government will be involved in developing those standards, with a view to protecting the very varied public interest. Whether it's a combination of FCC, Bureau of Standards, various professional societies which all work together, is a matter for serious consideration at this point.

But I do want to repeat that despite the profusion of practical implementations we see, there are information and technical basics which can provide longevity for whatever legislation results.

Thank you.

Mr. GAFFNER. So, enough talk, on to the action. We are breaking now, and on the way to board room one, which is down that way, and where all of the meeting rooms and where the demos are set up, it is suggested that you grab a cup of coffee. Several of us are here as instructors or guides to technologies, but especially the students who are here should be in board room one in about five minutes to begin the review with a live presentation, that will be put on.

And then students will break into small groups to kind of go to hands-on use of the various devices. I think it's been a useful morning, I hope it has. From here on, for the rest of this day, the emphasis is going to be on demos. We were hoping to have a four-hour break, but I think that's kind of gone by the board.

So let me say that the demo rooms will be running until at least 2:00, I'm sure, for those of you who want to stay through. We're not going to cut short on your ability to use these on a hands-on basis.

And therefore, we will then come back here at 4:00 p.m. and again have about a half an hour, five minutes each person, of explanation, and then go on into the demo rooms for the afternoon session.

AFTERNOON SESSION

Some people will be joining us as we move along. We have three sessions this afternoon where we will be talking in here. And then we will move into the demonstration room once again, and we hope to have each of the individual presentations run between five and ten minutes in length.

First, this morning we talked a lot about the various delivery systems and terminal devices. And the next session, through, is entitled Educational Technology. I think you'll find that actually, they're using technology that has been created and used in other parts of the new electronic media. But applying it to the great field education. And I think we're fortunate in having one of the biggest and most ambitious projects over the past decade represented here today, and to talk to us about the Plato system and various components of it, we have Jean Harris, vice president of Control Data Corporation.

Jean? Jean will be then announcing her second speaker.

Ms. HARRIS. Thank you, Haines. In one of my former lives, I was appointed Secretary of Human Resources for the Commonwealth of Virginia. In that capacity I received a great deal of media attention, because I was the first of my race and sex to hold such an appointed position.

Three days into office, I received a very beautiful letter from one of the local elementary schools. In childish scrawls was the following message: "Dear Dr. Harris, we are very happy to hear of your appointment to the Governor's cabinet. We would like for you to come and speak to us. Please talk three minutes."

Well, throughout my administration and in subsequent public speaking engagements, I have tried to adhere to that sage wisdom. However I think you're in for six!

Education has entered a new era. Advanced computer technology applied so effectively in other fields is now being brought to bear upon education and training. The company I represent, Control Data Corporation, was among the first to commit to the concept of computer based education and computer-assisted instruction, as (1) providing a more efficient and economical educational process, and (2) placing the focus of education where it belongs, and that is, on the development of each student's maximum learning potential.

Whereas I will speak specifically of Plato, the Control Data trademark for its educational curricula and course offerings, I offer Plato as the generic example of current state of the art in the field.

In 1962, Control Data and the Unviersity of Illinois began to develop a computer based educational system later to become known as Plato. In succeeding years, Control Data entered into partnership with other universities, software development companies, and more recently, with the advent of "user-friendly" terminals and authoring languages, with classroom teachers in selected elementary and secondary schools.

Plato now features more than 12,000 hours of courseware in math, science, computer literacy, business, foreign languages, the humanities and the arts. The Control Data investment in creating this library was one billion dollars.

Key features of the Plato system are: first, its ability to provide more accessible, cost effective, uniformly high quality education and training; Secondly, individualized self-paced instruction—that is, the student determines the pace of his own learning process.

Thirdly, the ability to update, to review, to explain, to animate and to simulate virtually any activity. Fourthly, the ability to simultaneously address needs of a variety of students studying different subjects at different levels of educational attainment or different levels of eductional competence.

Lastly, expensive recordkeeping capabilities which free teachers from routine administrative tasks, so that they can then concentrate on what they do best, and that is, providing students with personal guidance and support. Plato can pretest, educate, post-test and track educational progress of each student.

Two versions of Plato are now available. The first and oldest system is a network based upon multiple terminals which are connected to a large central computer. This on-line system provides access to the entire Plato library.

The second and more recent system is freestanding and uses a microcomputer plus flexible disk stored instructional programs. With the introduction and use of the microcomputer, Control Data has moved to transfer Plato courseware onto disks which can be used with hardware produced by other manufacturers.

In our hands-on demonstration this afternoon, you will see Control Data Plato online, Control Data Plato offered on the Control Data microcomputer, and Plato offered on an Apple, and on an IBM computer.

We all agree that education and training are essential for survival in the intensely competitive environment in which we live today. The flood of recent reports and studies on education in the United States indicate that the quality, equality and productivity of education and training requires improvement. Furthermore, traditional methods are becoming progressively more costly and are deemed by many to be inefficient.

The advent of the microcomputer has placed a new resource in the armamentarium of educational tools. In the classroom setting, the microcomputer and its accompanying educational courseware provide a new oppportunity for equity and parity between institutions and among students.

First, fast and slow learners can be individually accommodated by access to a variety of high quality computer based enrichment, enhancement and remedial activities. Second, schools with insufficient math and science teachers can now provide math and science courses through computer based lessons and courseware. Third, new courses and curricula can be created, and existing ones expanded through utilization of existing or newly developed computer based materials.

Equally as important, adults can be provided with opportunities for continuing education in a variety of topics in non-traditional settings. As example, Control Data operates vocational training and educational institutes. The Control Data Institute provides individuals with technical ability that permits them to enter a variety of computer, electronic and technical occupations.

Similarly, in service training can be conducted in a variety of settings for a number of occupations and professions, e.g., General Motors is using a Control Data course in robotics to upgrade the skills of trained workers.

Lastly, the low skilled or educational disadvantage can be provide with basic skills—job readiness, life management and job seeking skills. Again, illustratively, Control Data for years has been involved in providing training programs for the CETA program eligible individual and now for individuals eligible under the new Job Training Partnership program.

Computer based instruction is thus being used to address major needs for education and training in schools, business, industry, government, and we are looking at a future in which educational courseware will be used directly in the home.

The explosion in use of computers in such a large number of settings has generated demand for both standardized high quality educational courseware and customized offerings tailored to the unique needs and interests of the customer.

Meeting this growing demand is generating an explosion of software developing companies. Continuous Learning Corporation, a supplier of courseware for Control Data Corporation, is one of those fast-growing companies. I introduce to you Dr. Karen Cohen, president of Continuous Learning Corporation, who will expand on the courseware development process.

Karen?

Dr. **Cohen**. I didn't think I could be older than Control Data, but in fact my interest and work in applying computers and technology to educational processes predates 1962. For many years I've been doing research, primarily on the faculty of MIT, as Director of Research and Development at the Center for Advanced Engineering Study, trying to come to understand how technology can help learning, can impact on learning, and can provide more effective, more efficient and more appropriate delivery systems.

This work led to a natural involvement with Control Data Corporation and Plato™. Although my company is relatively young, being four or five years old, my interest in this field and work and trying to understand what makes for good education and the impact of technology on that process has gone on for a long time.

I was asked to talk briefly today about courseware. Courseware is education delivered through software and computers of various sorts. Of interest was the relationship between courseware and intellectual property. In trying to sort out what that really meant, I had to create a little heuristic for myself so that I could understand what coursewares are in terms of levels of complexity, impact of the technology, and intellectual property.

And I'd like to share my own thinking of that with you in terms of some of the products that my company has produced, some of which are being marketed by Control Data Corporation.

The first slide is a picture of a book. That may seem like a very strange way to start out a discussion of technology and intellectual property, but in fact, a book is a technology. A book is a technology that we've been using, in addition to the one that I'm using, namely, talking to you, for many, many years in order to teach, in order to educate.

Computers have become increasingly involved in this educational process. Computer involvement in education is developing and evolving. The first thing that a computer can do is enhance the value of a book. The second slide shows two such disks. We call them "value-added disks.™" The next slide is a sample screen that you might see when you're looking at the appearance of a value-added disk.

Value-added disks™ are attempts to be almost like a workbook on a book. They attempt to help people understand whether or not they've mastered the concepts in a book. There are problems; there are exercises; there's drill and practice; there's feedback. A value-added disk™ adds many of the features to a book that a computer can do for a learner often far better than an individual instructor. A computer, for example, can say, "Sorry, try again," 300 times to a student, although we don't really have that happen often. I think it would be very difficult for a teacher to be that patient.

My reason for showing you some sample screens is that it's my best guess that two thirds of the people in this room have never used a computer for any purpose whatsoever. And when you see some of these screens and then go on to the exhibits in the next room, at least you'll have a first blush familiarity of some of the things that appear on the screens of the assembled computers.

If you were using a value-added disk that accompanies a book, you would get all kinds of interactive things to do, numbers to fill in, equations to make, answers to give, and so forth. You'll have a chance to use these disks in the exhibit room afterwards. What you're really being given a chance to do is apply your understanding and knowledge and test out whether that works.

There's a much more elegant approach to courseware, a much more appropriate approach to adding value to the educational process. That is essentially using the computer as an entire delivery system. We've selected "Computer Concepts" because it is at an adult level, assumes high school reading skills, and it attempts to introduce people in a modular fashion to the understanding and powers of what a computer can do, and it uses a computer to do that. "Computer Concepts" is Plato™ courseware that is available on multiple micro computers. It's available currently on Apple and IBM, and it will be available shortly on the 110, which is Plato's™ own off line terminal.

If you were to start into this course on one of these computers you might see a screen like the next slide. It is a simulation of the keyboard. What the course does is direct you to certain keys, teach you how to practice with certain keys, and it actually brings you through developing data bases and word processing by the end of the nine hours that it consumes.

One of the concepts, for example, that the course teaches is what a "variable" is. To do that we start with an apartment house, and show people the difference between concepts like location, storage, address. You can put data one place, you can put it another place, you can manipulate the variables.

This is an example of some of the things you might be seeing in the demonstration as you go further in terms of what Plato™ is offering.

This screen represents a much more sophisticated use of the computer. This comes from the robotics curriculum that Jean mentioned. The purpose of this curriculum is to teach people in industry how to work and deal with robots. The simulation that you see here is one in which people actually go through the entire process of programming that robot to remove the god brick and put it in an oven, and record their moves. It's a simulation that people have found quite valuable prior to dealing with programming and working with actual robots.

One of the drawbacks of computer based education is that it often, especially on a micro computer, takes a long time for the system to reconfigure itself around new sets of information and data. And so one of the things we often see is, "One Moment, Please." And I've used such a slide to help us to "break set," in a way, because I'd like to discuss in the second part of my brief presentation, what's really involved in creating these products.

In contrast to writing a book, which generally takes one author—perhaps co-authors—but can be done by one person alone, there are several levels of creativity and intellectual thought that have to be put together to make courseware happen, to make courseware effective.

There are four components, or at least three, that are critical in developing quality computer based educational products. The first component is obviously the subject matter expertise, the author, the person who has the understanding and can convey the understanding that we're trying to teach to other people.

The second component is learning design, a relatively new field. In developing courseware, it's very important not only that we know what we're going to teach, but that it's determined beforehand how we're going to teach it, how we're going to prethink every mistake that a person can make so that the computer can allow for all of the branching, all of the individuality, and all of the special instruction that it has the capability of delivering.

The third component obviously is the programming skills. When one attempts to develop courseware, there are several levels involving output. First, there's what you write down, the intellectual content. The next thing might be the language that you decide to use, given a micro computer or a configuration. The language may have been created and licensed by somebody, or it may be in the public domain.

The third level is generally some kind of an authoring system, unless you do, as we sometimes do, namely invent everything from scratch, all of the drivers, all of the utilities, all of the components.

The fourth component is quality control. There isn't a piece of Plato™ courseware out on the market that hasn't been through every imaginable attempt to bust it. It's highly unlikely that Plato™ courseware will not function well. I think it's to Control Data's credit for having set standards of quality in this regard. It's one thing to have a good idea and try to program it yourself, it's another thing to try to turn that into an effective courseware curriculum.

That ends my formal presentation about courseware. I know that there are many speakers this afternoon and there may be many questions. The purpose of this talk was to introduce you to courseware and invite you to come and have that hands-on experience with what courseware is following this session.

Thank you.

Mr. GAFFNER. We will now shift into about ten minutes, 15 minutes on electronic publishing. This incorporates primarily the worlds of online data bases, videotext and teletext.

First, Myer Kutz from John Wiley Corporation will tell us something about the world of online databases which today primarily are being used in the business information field, some in the home, where the others are more mass market technology.

Mr. KUTZ. Thank you, Haines. In defense of those of us who have written books, and not to take issue with our last speaker, it sometimes seems to me it would take this long to write a book [hands spread wide apart], and this long to get an abstract painting out of the door [hands very close together]. It takes about this long to write a software program [hands six inches apart]. But that's only a bias.

Actually, I brought the simplest piece of equipment here, a dumb terminal that looks like a typewriter. You will see it in the atrium area outside the boardroom. It's connected to an acoustic coupler and to an ordinary telephone, and then connected online to a computer in Latham, New York, into which have been loaded a number of data bases.

Although I brought the simplest piece of equipment, it took me four hours to get it working this morning. Luckily, this hotel is well supplied with a publisher's favorite food, alcohol, which in this case I used to clean one of the keys of the terminal.

Actually, the last time I met with so many politicians in one place was back in the 60s when I ran a campaign—a successful campaign—for a seat on the Cambridge city council. Cambridge, MA, not Cambridge, Maryland. That's an office of such high eminence that the reward for a campaign manager is that you don't have to do it a second time.

Well, let me talk to you a little bit about electronic publishing. First of all, let's say quickly what the markets for this information are, and as Haines implied, they are professional markets. They include not only business people, but also, particularly, lawyers, chemists, and people who do medical research.

The data bases that are available online contain essentially three kinds of information. The business started with data bases that are essentially lists of bibliographic references. For example, Chemical Abstract, which is a branch of the American Chemical Society, compiles bibliographies of the world's chemical literature. You can search through these bibliographies to find out, for exmaple, what a particular chemist has written about phosphorus chemistry in the last ten years. Or what anybody has written about phosphorus chemistry.

The second kind of data base that you can find online include those that contain data, mostly the kind of data of interest to people in business, mostly economic data.

I think there is a display of software from Visicorp that you'll see.

Well, you can use data from data bases and plug that data into that kind of software in order to decide, for example, what our costs as a hospital administrator might be in three or four years.

The third kind and the newest kind of data base is the full text data base, that is to say, electronic editions of materials that have been published in print before. For example, one of the ones I'm involved with is the Harvard Business Review. Also the McGraw Hill professional magazines are all available online, full text.

And there are other publications from Elsevier, for example, another publisher who is here. The American Chemical Society has put its scientific journals online full text.

An important point about all of these data bases is that in most cases there was a prior print counterpart and that print counterpart was copyrighted. Often, you will see a copyright message on the screen, or in the case of what I can show you, on a printout of a data base, prior to actually getting into the data base.

As I asked before, basically in this industry at the moment, information is stored on central computers. There are many so-called hosts who operate computers with so-called search software with which you can search through the data bases. And basically the access is by telephone.

The real power of these system is that you can sort very fast through a tremendous amount of material. That's the whole point. Even with the full text, the point is not to read publications on screens. (People have been defending print, worried that electronic publication was going to take over from print and have always said, well, you can't take these terminals to the bathroom. Well, of course you can.)

But I think the point here is that it's not the notion of being able to read things on a screen, it's being able to search through large volumes of information to find out where pieces of information are. Then possibly you can print out an article at your convenience, or you can go get the original hard copy of the article.

The way customers are charged in this business is by time of access. This business really is—has traditionally been—run by computer people. Now that more and more publishers are getting involved in it, there may be—there is—pressure—I know I exert it—to begin to charge customers by subscription, the same way you charge for magazine subscription.

This is important, because one of the concerns, and I know you heard a comment about upstream downloading or downloading upstream or something this morning, is that if you basically charge by time of access and the information in the data base is captured by the customer on his own terminal, that means the customer can then search through that information with the proper software, without accessing your data base.

He cuts himself off from your data base, searches locally, doesn't pay you anymore. That is possibly copyright infringement. Of course, the discussion revolves around that word downloading because it's an extremely important word, as you heard this morning.

In the future, one of the ways to get around that may be the pricing mechanism, which as I said would be subscription pricing, rather than charging by time of access. Or by changing the nature of the business. Rather than having a business where users have only one means of accessing the information, which is dialing up from remote terminals to central computers, with the proliferation of more and more powerful computing equipment locally, you'll be able to sell people tapes of data base, which they can search through themselves, and you sell them the tapes on a subscription basis. Those would be for main frames. You may even be able to sell information on disks for micro computers, when there's enough storage capacity, or there will be use of an even newer technology, which is video disks or even laser disks.

These disks allow for a tremendous amount of material to be stored on them, and they have been developed now to the point where you can search them with the same facility and speed that you can search regular online data bases.

So basically that's the shape of this industry. Those are some of the questions that the people in it are grappling with. And if you stop by the terminal, which having been fed enough alcohol and I think is working, I'll show you some data bases in action.

Thank you.

Mr. **Gaffner**. Two of the technologies in the electronic publishing arena that get most confused are videotext and teletext, that we'll now be hearing about.

We must remember, as we look at these, that as they have become a reality in the marketplace, though they are still experimental, that in actuality most commercial individuals and companies now see them more as being viable in transactional services than a variety of different applications in addition to the delivery of information.

After the UK spent $80 million trying to launch Prestell as a home information delivery system, all of it wasted and now disbanded, there has been a lot of disillusion about when the market will actually be ready for delivery of information to the home.

Therefore, these systems are being implemented with heavy emphasis on advertising transactions and a varity of other applications. But when they do prove themselves, they will then become massive ways to deliver all types of textual information.

Albert Crane from CBS will start first, and all of these are going to be demonstrated live in the other rooms after these talks. I do want to say as Albert is coming up here from CBS, which is going to show us teletext, that we are in the vicinity of the world's greatest experiment now in this arena, Viewtron, which John Wooley will be talking about. Viewtron is now rolling out in South Florida. How many subscribers do you have now, John?

He's very secretive about that; they'll never answer that. I thought I'd get him in a forum like this. But at any rate, that experiment which will be piped in live, I want to say, I've seen John's slides around the world. They're very beautiful, and he will not be showing us slides because he'll be showing us live. So I encourage you to make sure you go by and see those. However, he said the slides from teletext are similar to video disks.

So we'll turn it over now to Albert Crane.

Mr. **Crane**. First, I'd like to thank Stan Gerendasy, Director, Engineering & Operations, EXTRAVISION who is director of operations, for making this all possible. We will be lodged in the other room. I'll also mention that NBC is on the air in this market during their network time. We hopefully will be on the air during all time.

I don't know whether I'm going in the right direction, I guess I'm not. All right, thank you.

Secondly, I'd like to mention that the pages that you're looking at are all done in the new technologies; these are all computer-driven graphics. While Haynes is correct that we were in the experimental stage back on April 3, 1983, we premiered with a nationwide service called Teletext, three days after the FCC approved us. As you know, there are 83 million television homes. We're currently in 71 million television homes with this product that I'm showing you.

But before I take you through that, I'd like to tell you what we're not. Firstly, we are not videotext. Videotext is two-way transmission of data, which John will be showing you at great length and has available to see, as we do.

We are the one-way transmission of data. Now, you can say one-way transmission of data; how do you get there? You've all seen the black bar on your television set. The black bar is called the vertical blanking interval. We call it VBI teletext, vertical blanking interval teletext.

That consists of 21 lines. In those 21 lines, we've been authorized to use six of them, of which we've now selected four, lines 15, 16, 17, 18 through which we will transmit data. If you look on Channel—is it 9 here? Our CBS affiliate? Four, thank you. I'm a New Yorker, what can I tell you? California, you flip the vertical line and you will see a little stream of white data. That's the CBS teletext service, known as extravision.

So here, we're on the vertical blanking interval, as is NBC during network time. Think of it as an electronic carousel spinning very very quickly. But once you press a button, the slide drops down onto the full screen. So we're not talking about a transmission of data that just uses up portions of the screen; we're talking about transmission of data that drops down into the entire screen.

And as I just demonstrated, here are some of the things that we can do. This was a benchmark day, as a matter of fact, it was May 23 that's the day the Dow just got to 1200. Apparently last Friday it just dropped down to 1200. So it gives you the perspective as to where things are.

This is the kind of pages that we do. We'll be demonstrating these to you live in one of the demonstration rooms later. I call our service a color newspaper that updates itself every 15 minutes. That's in essence what we're able to provide.

Here's some other examples of the kinds of pages. Here's a weather map. The weather doesn't change every 15 minutes; you can probably get away with changing the weather three or four times a day, and accurately represent what's going on.

Here's another use of our service, the airlines. In this case, I believe all happen to be late. Well, yeah, I guess they are. That would never happen, of course. But that's an online service that we can provide to viewers. Here's an example of a crossword puzzle, electronic crossword puzzle, where you have a degree of interaction that can be done. But not the kind of interaction—don't let me mislead you—that can be done with Viewtron service or banking at home (or Pronto's Chemical Banking System), or any of that kind of thing. We're not two-way, but a one-way service.

One of the most important features of our service is that we are "on demand." And by that, I mean you simply press a button with a hand held device, similar to a remote control. This is the remote control device that I hope you'll all have a chance to work with it later.

What you do is, you press two buttons. We have a 100-page magazine that's spinning very quickly in the air. You press two buttons, ask for page 05 or 87 in this case. And you press the entry button, and within ten seconds the slide drops down into full screen. The carousel has to go the complete rotation sometimes, and it can take up to 20 seconds. If you happen to be on page 86 and you ask for page 87, you'll get it almost instantaneously. But if you ask for 85 it will have to go the full rotation, taking 20 seconds.

So it's approximately ten seconds away for an "on-demand" service. Secondly, it's very user friendly. You only need to be able to press two buttons. You have to be able to press the correct two buttons if you want page 21 or page 87. But you can get the service very quickly, and you don't have to be a computer whiz to figure out how to use our service.

Thirdly, and probably, most importantly, our service is free to the American public. Like television and radio, we expect to be advertiser supported.

Now, that's all well and good. You can say, you're in 71 million homes, Albert, but how do you get it? How do I see it? Well, that's the obvious question. I've been in this job 14 months, and we think we're on the verge of solving that problem.

The problem comes to—teletext technology has been in the process for—we started in the spring of '79. The British as you know with their Oracle have been on the air apparently in a million, five households—

CBS started a long time ago with trying to improve the technology. We finally have gotten the product now available, and what we need of course are the decoders because if you can't see the product, well, you don't have a business.

So for the next couple of seconds I'm going to give you a little progress report on what's going on in the decoder field. Firstly, there are professional decoders. These cost thousands of dollars and are available from two major vendors. One is a Videographic Systems of America. That's the French government. What was called the Antiope system has now been brought up to our system, called North American Teletext Broadcast Standards, NATBS. And we are available, and you can purchase the decoders from Videographic Systems of America.

You can also purchase the decoders from Norpak, a Canadian firm, which is the teledon technology. Again, it is compatible with NATBS.

The Norpak people have decoders available, and can be purchased. Right now, they're basically being purchased by television networks and by affiliate stations, not by the public. So then you ask, when is the consumer going to be able to get in the game?

Well, the good news is that at the recent CES consumer electronics show in Las Vegas, both Sony and Panasonic made announcements. They announced that in mid-1984, Sony would be in the game. We just happen to have done a teletext page announcing that feature; probably there are only 50 or 60 people in America who could see it, but we thought those people might be interested.

And Neil Van derDusen who's the president of Sony consumer products, said, Sony recognizes the significance of new information delivery systems in society and the future growth potentials of the teletext interest in the United States.

So we've got the Sony people involved, and they expect to have their product out in mid-1984. The next major vendor to sign on is Panasonic. And I have some of the brochures here which are very generic in their pitch. They do not attempt to sell their product, but I do have a couple of these available. It discusses the kind of product that we're about to offer. It's kind of a little leave-behind; it's not something that CBS has anything to do with.

But Panasonic has announced delivery, and does have three or four thousand decoders available for a list price of approximately $900. You have to purchase top of the line TV called the Omni, which is their version of the Profeel. The product, that we have here to show to you today, is a 25 inch Omni, plus the decoder which sits on top. The decoder lists for about $900, they expect to be selling it in the open market for $700. However, I want to comment in a few minutes about where we think the prices are going, the decoders, because there is no marketplace, in my view, at $700.

Okay. Quasar is also in the game. They're a division of Matsushita and they also announced in our standard. Beyond that, what about some of the American manufacturers? We know that's coming soon, RCA will be in the game. RCA will be coming out with a product that's built in. By that, I mean it's not a stand-alone unit.

In mid-1985, we expect RCA will have made some announcements, but we're not in their business. And of course, RCA owns NBC and that would make some sense, for them to be in this particular game.

Zenith has made some announcements in another standard. We expect they will come along in our standard as well. In addition, Hitachi is about to get going in the teletext business. So we've got five or six major vendors about to produce consumer decoders. Our product, whether it's NBC teletext or CBS's Extravision, you will begin to hear about and see more about in the trade press. Because the consumer will begin to be able to see it.

Now, there are a couple of issues that I'd like to just quickly touch on. Gladly continue in private, or perhaps even better, Bill Lilly will be here tomorrow representing CBS on the policy issues. You can discuss some of these with him.

I'd like to just briefly tell you what these issues are. Firstly, the FCC did not give us a standard. As in many cases, the FCC today has a laissez-faire approach, and is suggesting to let the marketplace decide. The two standards are the North American Broadcast Teletext standard, which is the one we've endorsed, which NBC's endorsed, AT&T and many others have endorsed this, along with the Canadian government and the French government.

But there is another standard, and the other standard is called World System Teletext, and it's featured basically by the British. And this is what the Oracle service would look like, if you happen to have an Oracle opportunity.

We didn't bring it in, but this is what I call the "Lego look", which we have walked away from. It's suggested that this kind of technology is not good enough for the American public.

Now, the reason I say that is because of advertising it over the air. We do not think—and we'll go backwards for a second—that color separation as it occurs on that map is possible for the American advertising family. We think that the "Lego look" is very difficult to sell to the advertising community.

So as I said, I'm going forward again. We've come with a product that looks more like this. You can see 50,076 dots on that screen, as opposed to 4,800 squares. You see colors laying on top of each other. We see a product here we think we can sell to the advertising community. Primarily because we can make logos very small. The smaller we can make the logos means the more information we can put on the page.

So that's the service that we're attempting to sell. That's why it's going to be free to the American public, because we expect the business to be determined by the revenue that we can get from advertising on the air.

Let's quickly talk about localism. One of the more important aspects of television, as you know, is not just the networks providing M*A*S*H and After M*A*S*H, et cetera, but the local station providing an individual marketplace product. What we have in this country, as I said, is 85 percent are passing our current product. Eighty-five percent of the United States has the product on the air. More specifically, we have one market, Charlotte, North Carolina, which is about two weeks away from what I call local origination.

We're preparing a 100-page magazine which we're asking our affiliates to take 50 pages away from us. So it will be a combination of a local magazine and a network magazine that's going to make the most sense. Also, in Buffalo, New York, we have an affiliate there that's about to get into the local origination business.

To answer a question I know you might have, what is it going to cost the station to get involved. About $150,000 to purchase the hardware. Probably a staff of about four people, incrementally, about a $300,000 investment for a station to get involved, to bring it up.

We think that just the network service is not sufficient, because we see this as very much a local business. Just a couple more comments. Another issue that's very important to the television business, of course, is "must carry". The FCC did not give the teletext business a "must carry" mandate. A cable operator has the right to strip teletext. Because CBS did not feel that that was in our best interests, or in the industry's best interests, we have asked for a reconsideration petition at the FCC.

And if you have questions to that end, I'll let Bill Lilly speak to them tomorrow.

Probably the most important aspect of what I call program related, is how we relate to the television screen. We have a feature called the burst through feature. So while someone who has one of these decoders and has the remote control device as I'm holding up here, with a decoder on top of his television, has an opportuntiy for a feature to burst through the screen. This will only happen in homes that have decoders; it will not happen across the country. We can burst throught information that relates to what's going on the television.

The best example of which, of course, is captions for the hearing-impaired. CBS has been strongly committed to captions for the hearing-impaired. Again, a very sensitive issue, one that we can deal with over cocktails or perhaps at dinner. But we strongly believe that the NATBS captioning that we're providing for the American public is the right way to go.

The reason that we feel so strongly is that we're not just talking about a $700 or a $900 decoder. What we're talking about is a VSLI chip built into television sets in mid-1985, bringing the cost down to $150 to $200. That's why we believe so strongly that ours is the right technology. We're not talking about a service for the hearing-impaired that's going to cost $300 or $400 or $500 or, much worse, $700 or $800. If that's the product that we have to offer, then we don't think there's a marketplace. Until this gets built in as UHF is built into televisions today, we do not see it as a viable marketplace product.

So we're looking for the day when the chips will cost $25 or $30 with an add-on feature, perhaps $50 or $100 for the consumer. And that's the day that we feel we'll be able to provide a service, not just for the hearing impaired, but for the sight impaired.

Everybody in this room has an opportunity to learn and get more information that you might want to know. An example might be the airlines leaving here, when do they leave. Bridge closing, school closing. We can provide all kinds of community service that the regular television and radio stations cannot easily provide.

So we have this opportunity. I'd just like to close with a couple of slides. The product as you'll see it in the other room, builds on the air. So what comes on the air, bang, doesn't come on this way. So there could be a certain amount of doubt when the picture starts to form as to who this might be, but I can't demonstrate this here. I think everybody figures it out fairly quickly, that's exactly who that is.

Now, the other feature I wanted to show you, because of the graphics we can do, that's obviously a candidate for the presidency. We have another candidate for the presidency that I understand is going to re-run after—you may or may not be aware of this—sometime in mid-April, CBS is doing a mini-series on another president. And word has been around that he's going to run again. And of course, Uncle George may or may not make it as the Democratic candidate.

I thank you all very much.

Mr. GAFFNER. Albert, I thank you. Just one comment on the teletext. In Europe, it's one of the problems you also face, though, the British standard might not appear as well. They have over a million users of teletext in homes. It also is free in Europe, but there it's subsidized by the government as a news media to the citizens, where here in the U.S. it will take an entirely different course being an advertising supported medium by the network primarily.

Now, for hearing about the largest world's experiment today going on roll-out, commercial roll-out I apologize, John. It's definitely commercial. John Woolley from Miami, the Knight-Ridder Group is building this very fine system called Viewtron.

Mr. WOOLLEY. Thank you, Haines, especially for emphasizing that it isn't an experiment.

I brought my keypad, too, and if you're wondering why Albert and I are carrying them around, it's because the—some refugees from Mark's bar mitzvah have turned out to be high techies and chipheads. [Laughter.]

And it's the only way that we can keep our machinery from being selectively destroyed, I think, each time we leave the room. If you don't believe that there's a market for this kind of stuff, I suggest you go to Mark's bar mitzvah. [Laughter.]

Somebody a little earlier said that maybe two thirds of the people in here have never used a computer. Could I see a show of hands of people who have never used a computer?

There may be a market, okay. I'm the editor of Viewtron, as Haynes told you, and Viewtron is in fact a commercial venture down here in South Florida. Let me tell you a few things about it. I'll be brief, and I'll get out of your way so you can punch the buttons, because that's what important.

Viewtron is an electronic home information service. The information is stored in the central computer. It is transmitted into the home over regular telephone lines. There's a decoder that you have to buy, but then it's displayed on a regular TV set.

If you have it, you can shop with it, you can bank with it, you can help your kids get educated, maybe. You can read the latest news, you can read weather, you can read sports, you can send messages, you can play some games, although they are not games that really look like videogames. In some ways, they're a little more challenging. In some ways they aren't as good.

And it does all of this because, unlike Albert's system, it is two-way. And that means that messages are sent from the home back to the computer as well as being sent from the computer to the home. And I won't go into that much at all. It will be obvious to you when you see it.

The displays in general look very much like what Albert just showed. And you'll see those as well. But as I said, the delivery is different. It comes across telephone lines. It has nothing to do with commercial TV. It has nothing to do with cable. It is straight phone lines. It is much more like a computer talking through a modem to another computer somewhere else.

Viewtron has been developed by two—or actually, three corporations. As the editor, I work for Knight-Ridder Newspapers, which is a billion dollar newspaper company headquartered here in Miami. We own the Miami Herald, we own the Philadelphia Inquirer, we own papers in Detroit, San Jose, St. Paul and a number of other cities around the country.

RESPONSE FROM AUDIENCE. [And Long Beach.]

Mr. WOOLLEY. Absolutely. And Little Long Beach, too.

We program and run the central computer, but we developed the service itself. We've been at it for about five years, and we have spent about $30 million at it so far, or will have, by the end of this year. The second and third companies are AT&T and Southern Bell. And they developed—AT&T developed a thing called the Sceptre terminal, which they now sell, which is the decoder that we use. And Southern Bell provides a special local area data phone network which as far as the phone customer is concerned, he never knows he's on it. It just seems like any other phone network.

And some of you will certainly recognize now, with Viewtron and the Sceptre terminal, at least one of the reasons why AT&T showed some grudging willingness to break itself up. Obviously, that's all significant.

If you like what you see today, and I'm going to make a pitch, you can go buy a Viewtron. You can go about four miles up the road to the Burdines store at Broward Mall and you can purchase the Sceptre terminal for a special introductory price of $600, even less than a teletext decoder, for that money.

You take it home and the Viewtron subscription price is $12 a month, flat fee.

Well, but in addition to them there are also the—there are computer companies who will likely be making equipment compatible with the kinds of services that Viewtron is—at the point that they're satisfied that there's a market for it.

In addition to being an editor, I'm also a lawyer, and so I just love to talk about the impact of all of this on things like freedom of the press and privacy and copyright law and all of that. I won't do that now; I'll do that later if anybody actually asks me.

Thank you.

Mr. **Gaffner**. We've now covered one major part of electronic publishing. We now move on to the optical video disk, which is also related directly to the field of electronic publishing, yet with virtually a much broader scope.

And there, confusion exists, of course, becasue we've all been blitzed with the video disk campaigns of RCA and others, and we're talking now about a different use of the technology. We're not talking now about the entertainment use of the video disk technology.

To tell us about the new directions that are unfolding—although, is Sony getting into the entertainment in there in their display?

Mr. **Gaffner**. Okay. So the afternoon and the demonstrations are not as—North America-Phillips does show their video disk used as an entertainment device. This is more of a storage device. And to tell us about it and introduce the others on his panel we have Joseph Price, who is the chief of the science and technology division of the Library of Congress, and also director of the Library's optical disk pilot program.

Mr. **Price**. Thank you very much. It's a pleasure to be here. I see that we've accumulated all of the spare time at the end of the program. However, we won't use it, we'll try to go quickly, because we know that you're all eager to go see some of this very good equipment that's been assembled here.

I would like to take just a few minutes to talk about the application of the Library of Congress' optical disk program. The topic is relevant to this seminar, because of the many copyright issues it raises. I've tried to reduce a large amount of information down to just a few slides, which I will have to quickly flip through, unfortunately. If I cover something too quickly, please by all means stop and ask me during the demonstration period for an explanation. I should also like to point out that in your notebook, I believe, you've been provided with a brochure about the Library of Congress' program, and that should provide you some additional information which I will have to go over very hurriedly.

After I speak for a few minutes, I will introduce Mr. Steven Gregory from New England Technology Group, and John Hartigan from the Sony Corporation. These two gentlemen have kindly agreed to come and bring their very advanced state of the art equipment and approaches to this important topic of using high technology as a means of preserving and storing knowledge, and also as a means of creative access to that knowledge. And that, in effect, really are the two core themes of my talk, that is, preservation of man's cultural knowledge, and more creative approaches to the use of this information.

You've seen and heard an abundance of acronyms today. I'll try not to throw anymore at you, except one very relevant acronym, which is the one which I will try to use as the guiding principle in my talk. This acronym is known as MASE. And that means, the "mind absorbs what the seat endures." So I'll try not to have you sitting too long.

You will hear me during this presentation occasionally making reference to analog and digital types of disks, that is to say, video disks and optical digital disks. We're using both of these kinds of technology in this program. I won't try to make the distinction now, but there are some technical distinctions. Again, I invite you to catch up with me or any of the other two speakers for an explanation of these technical distinctions.

Suffice it to say for now that the analog disks are better suited for color motion sequences, which is an important part of our pilot program, and digital is better suited for pictures or digitized snapshots of printed pages. So that's as much as I will say about that distinction.

Now, this talk features a number of opportunities provided by optical disk technology which we hope to exploit. And I'll go through these on the slides now. This is a three-year pilot program, and I put a great emphasis on pilot, because we're in pursuit of a lot of answers which we hope will be of benefit to the Library in the future.

The objective of this program, as you can see, and I won't read it for you, is to exploit the use of this technology for the opportunities it presents in information management and preservation. Optical disk as you've come to know is the recording of information at the wavelength of light, and this recording and reading back is accomplished by lasers.

Why optical storage? Because of their high density and resulting high storage capacity, optical disks permit the efficient storage and retrieval of digitized images, and because they are read by reflected light, no wear or image degradation results from playing the disks.

This is very very important when you are considering the preservation. Because unfortunately, as much as we would like it to be true, the statement on this slide ("Man builds no structure that outlives a book," Eugene Ware, circa 1898) is not true. Changes in the paper making technology over the last century have resulted in the use of acid based paper, a cheaper form of paper, easier to manufacture. But unfortunately it has the negative consequence of books literally deteriorating on our shelves.

This slide of a crumbling book being blown away by a staffer as if it were a dandelion is not an exaggeration. We have books that are highly embrittled and are coming apart, like this. And of course, since we get materials from all over the world, many of them arrive at our doors already in an advanced state of deterioration.

We are also seeking better means of service in this project. We would like to be able to provide more than one user the same sort of information at the same time if necessary. And when you have custody over about 80 million items, inevitably some of them are not going to be on the shelf. We would like to reduce the incidence of that sort of problem as well.

So we seek to exploit several opportunities here in the preservation area. We seek a stable storage medium, one that will last not in terms of tens of years, but in hundreds of years; to electronically monitor any possible loss of this information that we've so stored; to transfer it without a loss in quality; and again, I repeat, the important point of no physical contact with the media itself.

To balance the preservation concerns, we are also interested in exploiting these retrieval and storage opportunities, these service opportunities. I won't go through the list, many of them are apparent to you, especially from what you've been hearing today.

This project, as I said, is one of three years duration. We divided it broadly into two categories, print material, where we're using the digital technology primarily for text material, and the non-print side of the project, where color and motion sequences are very important.

This slide is of course is representative of print materials, which we hope to put on the disk, including, I should mention maps and manuscript and printed sheet music. And this information is scanned by the scanner that you see on the right, and displayed on the very high quality, high resolution screen. This slide is broadly representative of the kind of quality. And, of course these images are capable of being printed out by the laser printers shown in this slide.

The images are stored on an optical digital laser disk as depicted in this slide.

Now, the non-print side, where we are using analog technology, which is primarily a television technology in this context, we had high quality photography made of a number of our special collections in the Library of Congress. This photography was subsequently mastered onto video disk by our contractor, the Sony Corporation of America. It will be then presented on television screens with caption information overlaid on top of it when desired by the user, and sometimes we will also, just for experimental purposes, use a separate television screen which contains the captions, so that the picture is not encumbered by them.

In the analog portion, we are making several video disks, and we are also, I should say, making two compact audio disks. You saw those and heard those this morning.

With regard to the laser video disk, I won't go into a great deal of technical detail, but basically there are two kinds, which permit stopping at pictures (continuous linear velocity), I should probably explain to you that there are 54,000 frames possible on the first type of disk. You can use that for storing and displaying still pictures. In other cases, if you want to have long sequences of motion pictures, you can use the continuous linear velocity, the second type of disk.

Still image disks are where we're using the 54,000 frames as separate frames of information. There we will store a number of photographs and other images, for example, these Depression era color photographs from the Farm Security Administration and the Office of War Information collections.

We are storing some architectual drawings. For example, you might be interested to know that this was a rejected design for the first Library of Congress building. We are also storing examples from the American Cartoon Drawing collection, and a number of other motion picture and drawings.

A very important disk will be the disk containing motion picture publicity stills. We have unique collections of these in the Library of Congress. We're placing 90,000 on one two-sided disk, and will manage their retrieval according to various means.

I mentioned motion images disk. We're putting portions of seven color motion picture films, each filmed with a different color process on one disk. We're interested in using this as a means of testing the color image—quality of color images over time, and also in establishing a baseline from which we can compare the degradation of color in motion picture films, which is a very serious problem. The particular film, shown in the slide, "With the Marines at Tarawa," contains some very unique color combat footage, I believe the first ever produced.

We also will be creating a disk that contains teleproductions, that is, television productions, CBS news in this particular case. And I did mention to you that we will be creating a couple of compact audio disks from the very good programs that we regularly have in the Library's Coolidge Auditorium.

This is not the Library of Congress' first effort in using optical digital technology. We have had a responsibility over many, many years to provide cataloging card information to libraries around the world. This inventory has now accumulated into millions of millions of cards. So we seek to scan these cards and store them more densely onto optical digital disks, and be able to pull them back up and print them out on demand when libraries need them.

Well, this gives me an excellent opportunity to point out one other feature of this technology which we hope to exploit. And that is one of image enhancement. On your left of this slide you see one of the cards that had been soiled and abused over many years. It can be scanned and all of that dirt and grime effect wiped out and a new version printed on laser printers, that's what you see on the right of the slide.

Density is the name of the game, with the technology. This is one of my favorite slides. It illustrates the very large numbers that we refer to when we talk about storage density. We won't try to go through all of the numbers. Suffice to say that you can store a billion bytes of information on a disk, one side of a disk.

This slide is roughly illustrative of the storage area that is accommodated by different technologies. A printed page—I won't go through the numbers, but a page in effect as it is reduced to microfilm, as it is reduced to 98-frame microfiche and finally, as the same page can be stored on a digital optical disk. The slide implies that the storage on the disk would all be sort of clumped together. Let me quickly say that the bit stream associated with the digital image of the page would actually be stretched out on tracks among the disk.

So in summary, this slide repeats these various facets of this technology which we hope to exploit in this three year pilot program: preservation of materials, service, random access, space, compaction and image enhancement.

This next slide reminds us that this project is designed to help us answer these two questions: how can disk help preserve Library materials, and how can disk help improve Library research.

Thank you very much.

I would like to now introduce Steven Gregory, and he will tell you a little bit about what he will show you in the demonstration room.

Mr. GREGORY. We've seen how the optical disk is a very high density storage device. There's a few things that need to be added to that, however, to use it as a very effective information access device. And my company is involved in developing computer software and computer hardware to go along with such technologies as the optical disk, to help our clients get much better access to some of their information bases.

First thing we add to it is a computer, an external computer, which is usually a small micro computer, which can control the optical disk, which allows traditional information processing and recordkeeping technology to be added, so that—as well as the same kind of information technology that's used in text information.

This gives you the ability to access immediately huge amounts of this visual material in the case of a video disk, as well as text information. This means you can treat a photograph or a movie as a piece of information in your data base.

The other thing that you can add is some intellectual creativity as to the format, and develop new structures of information using this medium. So instead of—one of the things you can think about is the idea of something that's sort of like a book, except as you flip the pages, the pictures are movies instead of still pictures. Just one of the simplest ideas.

Some of the other ideas for the formats that this can take are simulation of very expensive or new pieces of equipment. You can actually use a video disk system to simulate a complex, high technology piece of equipment, something that's much too expensive to have a lot of copies of, to use for training, for example.

The other thing that our company is very interested in is adding simple mechanisms which allow people to communicate with the technology in very simple ways. And as you'll see in our demonstration, one of the things we use a lot is a touch-sensitive display. That is, it's a television screen which allows you to just punch the screen and point to various objects on the screen, thus eliminating some of the anxieties that people have about using computers or computer keyboards.

There are other devices as well. Someday, for example, speech input will be very prominent as ways of communicating with these machines to describe what it is you want to access from that system.

As the example that I'll be showing in the other room, we'll have a system which was developed with a large pharmaceutical company for training physicians on some new procedures in cardiology. Basically, it has several different modes of operation, and one of the most interesting, perhaps, is where the physician is given a patient history, you actually see the patient—you see cardiograms on the screen and so forth. The physician then gets to choose from several different diagnoses that they can make, and then follow up and suggest various treatment. And they can branch through all the possibilities, seeing the results each step along the way.

So we're looking at the video disk as the basis with which the micro computer is a very powerful personal medium, what we call a stand-alone system. It's very much a portable, personal kind of system which some day may evolve into the size of a book, with the same kind of features, which is a very flexible medium for accessing complicated kinds of information for presentation.

Thank you.

Response from Audience. Can I ask a question? You said something about simulating the way a particular piece of machinery might operate, without having to have those same pieces of machinery available. Assume you were instructing a class this size, and you didn't want to have just fifty machines for fifty people, but you needed hands-on individually at all stages. Do you tell me that you could have a machine with software that would literally stimulate the operation of a non-existent machine, non-present machine, and you could train people through a computer device to run that non-present machine?

Mr. Gregory. Yes.

Audience. By simulating what the machine woud do at every step?

Mr. Gregory. Right. This has been done for, for example, for a tank, to simulate the gunnery procedures involved in a tank. It cost a hundred bucks to fire a round. So there are simulators, based on video disks, that provide an extremely realistic kind of image for the sighting, and actually allow the operators to simulate what they have to go through in a battle sequence, using that.

Other kinds of simulators are for driving around, to allow you to literally choose the directions here, and you see a continuous stream of visual information which you can speed up or slow down, make turns. And by simply having the computer access the proper visual sequences which were filmed by traveling down the street, it's a simulation and you're actually in control of where you go.

Audience. Of course, they've been doing that for years. Even when I was in driving school, I remember seeing simulations. So what is so new about that particular kind of simulation?

Mr. Gregory. Well, as far as I know, without spending a lot more money, it's really the only way to—you can literally drive anywhere you wanted to in New York City, for example. You can choose if you want to turn a left on Fifth Avenue, if you want to speed up to 60 miles an hour and then stop. You can actually turn a button and change the seasons, watch it snow, if you like, as you're moving along.

Audience. I see.

Mr. Gregory. It's just a little different than—they had some mechanical versions of that. We had a little camera in a car and you were steering that. But this is all done in very inexpensive—let's say, $5,000 range type of a station. For example, a very good kind of system in any kind of high technology type equipment, for example, repair of an aircraft or repair of electronic devices. These are some of the areas that it's now getting a wide range of acceptance.

My basic point, I guess, is that where video disks might seem to have flopped as movie machines, which was simply one marketing choice for their first commercial feasibility, what we're seeing now is, when they're hooked in with computers, it becomes a much different story. It's a very interactive media. It's a medium for storing visual information and accessing it very rapidly. And this opens up just whole new situations for many different kinds of applications.

AUDIENCE. Thank you.

Mr. TAUSKEY. Thank you. I think just in reference to that last question, I might add that what we are seeing with interactive video disks is actually a new form of publication. And that should hold some meaning as you consider the copyright issues.

For example, I invited the Massachusetts Institute of Technology folks to come down and show us some of their very good work in their area over the last few years. Unfortunately, theirs is not very portable. They've got some very interesting experiments going on it, strangely enough, the school of architecture.

I have a video disk that illustrates a lot of the things that they're doing, which if there is an interest at some point during this seminar, if I can kindly beg the use of a video disk player from some of our demonstrators, I'll be happy to show you little portions of that. So just catch me if you're interested.

I'd like to now introduce John Harrigan of the Sony Corporation. I should say that John works with us on our Library of Congress optical disk pilot program. One of the contractors in that effort is Sony Corporation.

John?

Mr. HARTIGAN. Thank you, Bill. By the way, down here I thought I was nothing but a redblooded, clean-living young America boy, but I discover that I'm a supplier to pirates, when I got here.

The nice thing about working with optical disks is that they're shiny, and if the audience begins to go to sleep you can direct the light in their eyes and wake them back up again. [Laughter.]

The optical disk is really an omnibus medium. I tried to call the Sony disk a compound data disk, and the public relations department said, no, you can't do that. But it is truly a compound data device, because the disk I have in my hand has analog video, the kind of video that you're used to seeing on your TV screen. It has digital audio information on it. It has digital computer data on it. It's got analog audio, digital audio, all of these things. And they're all accessible. They're very rapidly accessible.

The farthest point of any piece of information on the disk is less than six seconds away. So that, for instance, with the little compact disk that the people from Magnavox showed you, you can store 550 megabytes of data. The information there is never more than a second away. On this disk, we can store a gigabyte, or a thousand million bytes of data.

I don't know much about the law myself, but I daresay that this disk can hold all that all of you know about the law on the one disk. [Laughter.]

It has incredible storage density. When we couple this—the reason probably that the video disk was a marketing disaster for some companies was that we tried to make a new technology do an old job. We tried to simply transport movies with it, when in fact it is—another acronym coming up—a ROM, a read-only memory.

The disks cannot be erased, they cannot be altered. They are in fact—if the data on them changes, then the disk becomes valueless. But they're very inexpensive. They're made of a very medium-expensive plastic, polymethylmethacrylate. There are about 15 billion impressions in the disk surface, and they're all discrete and they're all identifiable.

When we tie with ROM to a computer, we can—it's just—the number of things we can do with it, I've said often, most of the applications for the video disks haven't been thought of yet. And a magazine editor immediately asked me what those applications were. [Laughter.]

The equipment that I brought along to show you what you can do with a ROM of this size tied to a micro computer is in the next room. And I'd rather let the equipment do the talking. And so, thank you very much.

Mr. LEIBOWITZ. In terms of mechanics, for the rest of the afternoon, we have an hour and a half remaining before we need to break so we can get ready for the reception and the dinner.

But we have set up in board room three, one, in meeting rooms B and E, the same area where we went this morning for demonstrations, the equipment that you've heard described to you this afternoon, a demonstration of the Control Data Plato system in board room three, the other equipment that wasn't D&E is there.

There is also in the atrium area Myer Kutz with a demonstration of online data base access. And outside board room D and E is Bill Tauskey from Visicorp Corporation to show you how you can copy copy-protected, so-called uncopyable, computer software. And to explain to you a little bit about what software is, that you've heard so much about.

DINNER SPEECH

INTRODUCTION OF SPEAKER

Mr. KEPLINGER. I wanted to say a few words on behalf of David Ladd, the Register of Copyrights, to thank everyone for their participation, to thank Members of Congress for their participation in this session, and for asking us to organize this program for you all.

This evening, we're privileged to have a very fine dinner speaker who will be talking with us further. And there are three of us in the Copyright Office who have worked on organizing this program who are here this evening, David Leibowitz, who many of you know, myself, Mike Keplinger, I've talked with many of you on the telephone about organizing this meeting, how to get it going, and Harriet Oler, who has played a very important part and is a very significant contributor to our team effort that helped organize this whole program and got it going.

[Applause.]

And all of the other people in the Copyright Office too, who have been supporting us and working with us and helping get this program going for everyone. So we've asked Harriet this evening to introduce our dinner speaker.

Harriet?

Ms. OLER. It's really easy to organize a conference such as this one with such nice cooperation from everyone. And I want to thank you in turn for your wonderful cooperation.

Our speaker this evening, Dr. Martin Greenberger, has asked me to give brief introductory remarks, which I will do because I know you've heard a lot of dialog today, and what we're really interested in is hearing Dr. Greenberger's speech.

My briefness in no way denigrates his significant accomplishments. He is the IBM professor of computers and information systems at the University of California at Los Angeles. And he's the author of numerous books on science policy issues, including one written about 20 years ago called Computers and the World of the Future, which presages many of the issues which you all have come to discuss today.

He's currently working on a project involving electronic publishing and the intellectual property concerns raised by electronic publishing. And I think his background makes him a particular appropriate speaker for our symposium on copyright and new technology.

Without further ado, I'd like to welcome Dr. Martin Greenberger.

Dr. GREENBERGER. Thank you very much.

THE LONG-RANGE FUTURE IMPACT COMMUNICATION TECHNOLOGY ON SOCIETY

To introduce the subject of computer systems, I shall report on a conversation overheard in the Garden Restaurant last night.

These four professional women were sitting at a table in the restaurant talking about their careers, making comparisons. After awhile, it got a bit competitive. They started challenging each other on how far back their professions went—claiming seniority, as it were.

The first woman was a lawyer with the Copyright Office. She dated her profession to the practice of Roman Law before the start of the Common Era. This, she enthused, was the very basis of modern Civil Law. She buttressed her claim with references to the Code of Law of Hammurabi in Babylonia, a millenium earlier still.

The second woman was a physician. She spoke of the work of Hippocrates and Aristotle, and the perceptive investigations into human physiology and anatomy in ancient Greece during the third and fourth centuries B.C.E. As the the Laws of Hammurabi, she pointed out, they provided a code of medical ethics and designated a fee schedule for surgical procedures. And, to leave no doubt of her profession's precedence, she cited ancient Chinese medicine still another millenium before, with its theory of the circulation of the blood and the vital function of the heart, along with its detailed understanding of the proper points for acupuncture.

Then they turned to the third woman, a member of the House of Representatives. Hesitating and somewhat bewildered, the Congresswoman gradually began to speak in a candid way about the early years before her life took direction. With her courage mounting, she braced herself, then admitted to having pursued for a short time the calling commonly known as the *oldest* of professions. Silence fell over the group, whether out of embarrassment or simply because the Congresswoman's trump card clearly seemed to have won the contest.

The awkwardness ended as the fourth woman spoke up. She was a computer scientist—a systems analyst. "At the very start of Genesis," began the final contender, "it is written that God created the world from chaos." Suppressing a smile the computer analyst asked, "Who do you suppose created the chaos?"

THE COMPUTER

My talk this evening on "The Post-Print Society" could be subtitled "Computer/Communications as an Environment for the 21st Century." I do not mean to suggest by the title that print will be passe' in the 21st century, anymore than I think Daniel Bell meant that industry would be obsolete in his post-industrial society. I simply submit that the emerging electronic emphasis in the way information is collected, composed, and distributed could become dominant in the next century.

By the way, Daniel Bell is writing another book on the significance of technology. He has been looking for a name to apply to the current era: computer, electronics, information, telecommunications, teleprocessing? Which descriptor best captures the essence of the times?

My choice would be computer era. The computer has been and continues to be a profoundly fertile concept, intellectually as well as technologically. It promises to transform the environment of all civilized society and set an indelible tone for the foreseeable future.

It is interesting to consider the etymology of a term that connotes a pivotal age in the history of civilization. In Latin "com" means "with" and "putata" has a number of meanings including "think." So the computer is a mechanism to think with. This is a great rendition.

The first computers were not called that. They were referred to as analytic engines, difference analyzers, numerical integrators, and calculators. The computer I started with at Harvard University in 1950, for instance, was known as the Automatic Sequence Controlled Calculator (more frequently the Mark I). It was the first working computer. Its design goes back to 1939. With its clicking electromechanical relays and large banks of externally set switches, it took directions from programs punched with round holes into closed loops of revolving cardboard tape. This unforgettable equipment was in active service from 1945 through the early 1950s.

In those days the emphasis was definitely on calculation. These machines were number crunchers first and foremost. The Mark I, for example, produced voluminous tables of mathematical functions day-in and day-out, week-after-week, year-after-year.

Times have changed. Today, everyone realizes the computer has far broader and deeper connotations than originally recognized, going well beyond numerical calculation.

There have been five generations in the history of automatic computers, not counting museum specimens like that the Mark I. The first computers in the modern sense of the word, such as the Electronic Numerical Integrator and Calculator or ENIAC at the University of Pennsylvania, used electronic tubes. The Univac was the first such machine to be made commercially available.

The second generation came with the invention of the transistor. This was a big step forward. Transistors offered a much more satisfactory means of storage and logic. The third generation arrived with the introduction of printed circuits. Transistors were printed or etched on pieces of silicon. Such fabrication lent itself to mass production.

In the fourth and current generation, printed circuits have reached an advanced state. Circuits are being integrated onto chips with very high densities. This is known as VLSI.

People are now speculating on the fifth and even sixth generation. Fifth generation computers, called knowledge information processing systems, will be endowed with expert knowledge. Present day computers are serial machines. They basically perform one task at a time. Fifth-generation computers will be more humanlike in function. Their parallel architecture will enable them to do many things at once, roughly in the manner of the human nervous system. This could greatly improve the speed, capability, and versatility of automatic computation.

With sixth and future generations, computers will function more like biological systems, using biological storage and optical technology for logic and transmission. Computer technology has not reached the end of the road in any sense. Viewed retrospectively a hundred years from now, the late twentieth century may be regarded as just the beginning in the evolution of computer systems for control and communication.

THE CHIP

One measure of the progress already made with computers is the quantity of integrated circuits being packed onto a chip. Circuit fabricators currently compress 600,000 transistors on six millimeters (a quarter of an inch). Even as these 256k RAM chips are beginning to become commerially available, companies have already begun work on one megabit chips with four times the storage capacity.

The packing density has steadily improved since integrated circuits were first developed by Texas Instruments and Fairchild back in 1959. Each year from 1959 to 1973, densities doubled. They have been increasing at a rate of one-and-a-half times per year since 1973. Inasmuch as logical elements can only be so small and so close together, this constant improvement eventually must subside. Nevertheless, one billion transistors per chip is being projected by the end of the century.

As densities have increased, prices for computer chips have come down dramatically. In addition, the size of memory elements has grown from 8 to 16 to 32 bits. However one gauges it, progress has been quite remarkable. In coming years, there will be other breakthroughs and advances, each one outdoing its predecessor if patterns of the past are repeated.

Every step forward in computer technology has had an impact on society. Technological advance is a driving force and an impetus for change. But the effects are not just in one direction. Progress in technology is itself determined and modified by complex social forces interacting with political and economic interests finding expression in customs and contracts, legislation and law.

An obvious illustration is the set of regulations affecting patents and copyrights. One might find it curious that copyright has been asked to play such an active role in the development of chips and software. It is certainly ironic that the very technologies whose ramifications have most upset traditional copyright practice are themselves objects of copyright protection.

Chips and computer software are new forms of intellectual property. They are not at all the sort of product of creative endeavor the original framers of copyright legislation had in mind. Neither technology has yet been well defined or satisfactorily incorporated within existing procedures, despite the extensive use made of copyright by their designers and suppliers. These technologies need protection, but in a manner suited to their peculiar characteristics and to the critical roles they play in the manufacture and application of computers.

PERSONAL COMPUTING

Software has been vital to the development of computers from the beginning. In certain periods, the growth of software has been nothing short of explosive. The most recent such occasion was during the rapid commercial rise of personal computers during the first half of the 1980s, an episode amply covered by the media.

Only a few years ago, strategic planners in the computer industry were first proposing commercial production of personal computers. The idea was innovative and controversial to the large computer companies at the time. Market prognosticators were trying to sell the concept to management by forecasting sales in the thousands of machines a year. Their projections, viewed as much too high, met with considerable scepticism.

The record is that actual sales exceeded forecasts by several orders of magnitude. Revenues grew by factors of five in three successive years. The forecasts were essentially surpassed before the ink was dry.

Upwards of ten million personal computers now reside in homes and offices throughout the country. The number is expected to continue to grow significantly, if sporadically, in future years, with as many as one out of three households projected to have some kind of personal computer by 1990. There may eventually be as many personal computers as TV sets nationwide.

One sign of the quick eruption of personal computers is the amount of venture capital going into microcomputer-related fields as compared to other fields. In 1980, the energy and energy-related sector received about 20 percent of venture capital. One year later it received less than six percent. In 1980, computer-related industries received about 26 percent of venture capital. The following year they received 34 percent, over a third of all capital made available to new companies. Much of this capital went to firms producing either personal computers and especially software these firms need to round out their products and secure a foothold in the marketplace.

The software business requires only modest capital investment to get started. In addition, its main resource is talented and creative people. For these reasons, the business tends to be individualistic and innovative in nature and has typically been independent of the mainframe computer business. Large computer companies often do not manufacture their own software. Instead, they go outside to contract for it. IBM arranged with Microsoft to obtain the operating system for its personal computer. Companies like Microsoft are doing very well. Some starting quite small have experienced phenomenal growth.

The nature of the computer hardware and software industries may change in time. Once personal computers and computer work stations begin to saturate the home and office market, the dynamic growth historically experienced to computer hardware is likely to shift increasingly to software, as current trends already confirm. The result is that giant companies in computer hardware are going to want an increasing share of the software market to sustain corporate growth and reach ambitious revenue objectives. Computer programs for data services, electronic transactions, and entertainment may become to the computer industry what electrical appliances have been to the electric power industry. Companies like IBM will want to be prominent participants in this business of computer appliances. They will strive to be masters if not manufacturers of their own software. They will build their own operating systems and a widening variety of application programs as well.

THE NATURE OF SOFTWARE

The term "software," now in common everday usage, did not even appear in Webster's Unabridged Third New International Dictionary when it was published in 1961. It is perhaps not suprising that society would hesitate before accepting the name or even the idea of a form of information and intelligence that could not be read, understood, or made intelligible in the manner of the printed word, the standard for recorded knowledge.

In earlier days, there had been a tendency to speak of programs as literary works. This they clearly are not. The functions they perform and the purposes they serve are much more utilitarian and operational than literary. The use and usefulness of a program—its hallmarks—are not generally to be discerned from a reading of the code. In fact, the value of the program may not become apparent without extensive explanation, documentation, and first-hand experience in its operation.

Another difference between programs and literary works is the significance of copies. It is worth pointing out that one can use a program as one's own without copying it electronically. All one needs is ability to operate the program. A password allowing file access to another person's copy will do just fine. Assuming the owner has given approval, no law is broken by such use, ownership does not change hands, and no harm or modification occurs to the program.

On the other hand, copying is very easy and inexpensive with software, so easy and inexpensive that it seems futile and even counterproductive to attempt to prevent it. Society has been conditioned to think of the act of copying as a central issue in the effort to protect creative works. This may not (or should not) be so with software. The significance of copying must be rethought in the changed context of this nonprint electronic medium.

The set of instructions incorporated in software is an embodiment of basic ideas as well as an expression of specific elements and interconnections. For this reason, software protection has tended to fall between the cracks—between patents which cover new processes and ideas, and copyright which covers original expressions. Copyright has become a primary instrument for protecting software. Still, software is not well covered by copyright law at the present time despite the considerable accommodations made.

To some people, the simplest solution is not to bother protecting software at all. Let a thousand flowers bloom. Avoid the kinds of concentration and competitive advantage that the monopoly rights awarded by copyright foster. Promote free and universal access to software. Preserve ease of entry for new producers.

Despite their merit, these arguments tend to overlook certain realities. Protection is seen as necessary in the software business for two principal reasons. First, creativity is a very important resource of the business and should be encouraged. Such encouragement has traditionally taken the form of ample economic rewards. Second, the infrastructure of the software industry needs to be more fully developed. A young and dynamic industry requires a high level of marketing, support, and stability for continued growth and prosperity. Such growth, it is maintained, will not occur without the protected investment made possible by copyright privileges.

The effort to protect software—and chips as well—is greatly complicated by the fact that it is so easy to copy them. Their research and development costs, and the costs of building markets for them, are much higher by comparison. It may cost a company $40 million to develop a particular chip, and another $40 million to create a market for it. It is not fair to allow a second company to copy the chip at minimal expense and raid the market promoted by the first company without incurring any of the development costs.

GENERATIONS OF SOFTWARE

Computer software like computer hardware has evolved through a number of generations. With microsoftware for personal computers, the generations have succeeded each other with great rapidlty. Since the market lifetime for a particular product may be extremely short, software development costs can present a major problem.

By one means of accounting, there have already been five generations in the development of software for microcomputers. The first generation consisted of customized microsoftware programs designed by home computer hobbyists back in the late 1970s. These hobbyists were playing with computers like ham operators play with radios. They wrote programs in languages like BASIC, FORTRAN, and assembly code. The unique characteristic of the first generation of miscrosoftware was that it was composed solely by users.

The second generation began with the appearance of microsoftware firms. Their business was packaging programs with specific functionality. Now users did not have to know a computer language. They had only to press buttons, as on a washing machine, and the computer would go through its paces. This was a great advance. Computers were becoming much more accessible to the general public. User-friendly is the way it was put.

The premier example was VisiCalc, a spreadsheet program developed by a Harvard Business School student while doing a project for one of his courses. He recognized that his program had general applicability and proceeded to produce a commercial version of it. VisiCalc was the best seller among packaged programs until Lotus 1-2-3 succeeded it. The rousing success of the microcomputer industry has been tied to the popularity of second generation programs.

The third generation of microsoftware consisted of families of individually packaged programs. VisiCorp, the company that marketed VisiCalc, began to announce programs for word processing and database management with names like VisiWord and VisiFile. But the exchange of information between programs within a family tended to be clumsy and ad hoc. They were a family in name only.

Interest began to be focused on programs that combined several functions in a single framework. The idea had been pioneered at Xerox's Palo Alto Research Center (PARC). The Xerox Star system emanated from this work, and Apple's Lisa system (LisaCalc, LisaWrite, LisaList, LisaDraw, LisaProject, LisaGraph, and LisaTerminal) borrowed from it heavily. Lisa is the older sister to Apple's Macintosh computer, a current favorite in the marketplace.

Such systems provide the ability to display several windows simultaneously, a handy feature to which many users became attached. For awhile, VisiOn was though to be the windowing environment that would sweep the marketplace. VisiCorp looked for it to be its next major commercial conquest—the product that would assure the firm a leading place in the field. Because of delays and other problems, this did not happen.

The current fourth generation of microsoftware consists of integrated software. Programs are now more smoothly engineered so that interconnection between functions is less cumbersome, if still not trivial. Lotus Development Corporation integrated data management with the spreadsheet function in its very successful 1-2-3, then parlayed its gains with Symphony by adding word processing. Ashton-Tate, supplier of the well known D-BASE data management programs, came out with Framework, a direct competitor to Symphony.

Systems such as Symphony and Framework are highly sophisticated and esoteric to most people. Yet software companies have felt the need to advertise them aggressively to gain a competitive foothold. The marketing budgets of the leading software companies are unbelievable. Some annual advertising expenditures are larger than the revenues of teh same companies just a few years ago.

In the fifth generation, individual computers and computer users will be communicating with each other and sharing databases over local area networks. Fifth generation microcomputer software will make the network mode convenient and economical, allowing organizations to deal with multidimensional problems interactively.

In a large company, functions like finance, marketing, production, and personnel are typically the responsibility of different departments. Fifth generation software will link such departments and functions, enabling needed information to be shared, compared, jointly accessed, and maintained in a decentralized fashion.

In the newspaper industry, modern computerized news editing systems already permit the entire newspaper to be produced as a single database within an integrated framework. Reporters compose articles, editors review these articles, electronic copy comes in from wire services, classified ads are entered—all as electronic files maintained within the same computer system. Writers and editors at dispersed terminals have access to this detabase with different levels of access that reflect the structure of the organizational hierarchy. Such integrated operation over local area networks will become more commonplace as fifth generation microsoftware is perfected.

SOFTWARE PIRACY

With the commercial rewards so large and copying so easy, piracy is bound to be a problem with software. There are three types.

The first, which really should not be called piracy, is committed by hobbyists working at home. It has a long tradition. The practice reminds me of the way we used to trade baseball cards with other kids on the block. Your friend had two Joe DiMaggios; you had none. But you had two Ted Williamses and he had none. So you swapped cards to make both packs more complete.

The difference with computer programs is that you can make a copy of your program easily without losing the original. You give it to your friend and now you both have copies. The activity is widespread, both among individuals and within user groups. It has been going on for some time. Many software companies dispair of any official means to control it. Society is for the most part ambivalent about this type of piracy. In considering preventive measures, we must take account of what society frowns upon and what it accepts.

The second kind of piracy is more organized. Often commercialized, it can take the form of out-and-out fraud, as when somebody copies a program, repackages it, and sells it without making any changes. This is clearly wrong and should be prohibited.

But situations are not always that straightforward. The program may have been altered by manipulation, or it may have been incorporated into a larger program. In the least offensive case, not considered piracy, only the idea of the program may be borrowed. Lotus 1-2-3, for example, is an improved, expanded version of VisiCalc. Its creators do not pay royalties to the proprietors of VisiCalc, nor are they infringing on anyone's legal rights under copyright law. Copyright protects expressions, not ideas.

The third form of piracy can occur in a large organization with many microcomputers. In a particular aerospace company, for example, one group of engineers has 150 PC's assigned to individuals or pairs of individuals. The engineers working on similar projects use the same programs. Should the company be required to buy a copy of each program for each microcomputer? This could run into tens of thousands of dollars per program. Why should the engineers not share programs over the company's local area network as they share databases?

The way to deal with this third kind of violation is to appeal to the business ethics and sense of responsibility of the using organizations. Both sides can agree that it is reasonable to assign more revenue to the software producer in such instances than the price of just a single copy. Compromise and accommodation are possible through licensing arrangements and group pricing.

PROTECTION

How is the software industry responding to the problem of piracy? Copyright by itself cannot be the total answer. Difficult to enforce, it most frequently goes unenforced.

As one approach, the industry is resorting to technology to make copying difficult. For example, a chip can be embedded in a microcomputer with a unique serial number. For a program to run on the computer, it must have the same serial number. If a copy of the program is put on another computer, it will not work. Such forms or technological obstruction might be called "software locks." The trouble is, they block the ability of programs to be shared between computers and computer users for perfectly legitimate purposes. They may inconvenience the authorized user more than the would-be thief.

Another approach is to make a program available from a large host computer that can maintain control of its use and charge accordingly. Or there are ways of metering the running of a program by inserting a monitoring device in the hardware, or in the software, or both.

Still more inventive is a scheme called "weak bits." The idea is for a pattern of bits within a program to fluctuate randomly. Bits with this characteristic cannot be reproduced to operate in the same way with a copy of the program. But the program will not run unless they are present.

A related device is a set fo bits modified with each use of the program. As with weak bits, these changing bits must be present, but are not part of the operation being performed. They ultimately self-destruct after the program has been run a prespecified number of times.

Another notion called the "dead bolt" is a piece of hardware that the user must buy along with the program. The attachment hooks into the computer and must be activated before the program will run. It is obviously not something users take to very enthusiastically.

Yet another approach is the warning label stating that a given program must be used on the designated computer, or that it is produced by such-and-such under the following restrictions. Like the label on a mattress, it is prohibited from being removed under penalty of law, and affixed to the program for its life.

Labels and other identifying elements can be hidden electronically within a program to help in detecting piracy and waging a law suit. The electronic marker found in a suspected copy of a program provides legal grounds against the copier.

The ingenuity does not stop with the inventors of such technological tricks. It just begins with them. A counter-culture has arisen. "Locksmiths" form a sub-industry of clever individuals who seek to unlock or defeat these protective devices and technological safeguards. It is fair to say that no one has yet developed a software lock that cannot be broken. It is like the arms race. The lock designers makes a technological advance, then the locksmiths outdo (or undo) them. This induces creation of still more sophisticated measures and countermeasures.

CONSUMER PERSPECTIVE

Copy-protect devices may continue to proliferate with ever increasing effectiveness, yet it is the marketplace that may have the deciding vote. Consumers are likely to reject programs with limitations on their ability to be used freely. A restricted program will not be as attractive to consumers as a competitor's alternative that is free from inhibiting controls. The preference of users for less restriction may eventually undermine the marketability of copy-protected programs.

Why is there resistance to protective mechanisms? People who buy a program want full access to it. They want to be able to look it over, learn from it, and adapt it to their needs. Protective devices prevent this. They do not allow pieces of one program to be incorporated into other programs. They inhibit the free exchange of programming knowledge and the building of ever-larger software structures. They impair creative flexibility. This flexibility is very important to the health and progress of the software industry. Without it, it seems unlikely that the industry will be able to reach its ultimate potential.

Some believe that once a program has been written and bought, it should be available for all to see and use. This view, considered maverick if not naive by copyright lawyers and other proponents of traditional restrictions, would have software producers spurred on to greater challenges by a process of full revelation. The mavericks regard concerns about piracy as excessive and paranoid. The more the program is known and shared, they say, the better its sales will be—and the better the public will be served.

The consumer has practical concerns. A program may crash and have to be replaced. It would be convenient to be able to supplant it with a copy of a friend's program. Instead it may take three weeks to get a surrogate copy from the supplier. Or the consumer may want to shift or adopt the program to a newer computer. Protective devices generally make this impossible. If the program has a problem, how is it diagnosed? Suppose the program does not load? How does one know what is wrong?

So copy-protection can alienate consumers and be detrimental to the acceptance of a program in the marketplace. Critics of copy protection point to the example of the WordStar program of MicroPro International Corporation. All through the first part of its life, it was never copy protected. Yet it has been commercially the most successful of word processing programs.

When MicroPro came out with its WordStar 2000 improvement recently, a columnist about to review the new version discovered to his chagrin that a copy protection feature had been added. This made the program incompatible with the hard disk attached to his personal computer. Rather than proceed with his review, he used his column to complain about copy protection devices and announced he would not review WordStar 2000 until he could use it with his hard disk. Many readers wrote in that week agreeing and lending support. Not long thereafter, MicroPro distributed a press release dropping the copy protection feature.

AN ECONOMIC APPROACH

Perhaps copying is not the real issue. There are other rights to consider besides copyright, such as access right and service right. Copies are not the only, or even the main things vendors are selling. They are also selling service and support. The large gap that exists between the price of a program and the cost of copying it is accounted for in large part by the need to advertise and distribute, and to provide customer assistance, documentation, updates, and dealer support.

This suggests another approach to the piracy problem. Instead of making it more difficult and expensive (legally as well as technologically) to copy, software suppliers might instead seek to reduce copying by increasing the value of the original. That is, they can make the service and support features of the product a more explicit and dependable component of the purchase agreement. This would be an approach to the problem of copying through the marketplace rather than via technology or the courts.

There are numerous ways of increasing the value and attractiveness of the original. These include special keyboard templates, charts, and user aids packaged with the program; a user manual that is well written and physically appealing; and a continuous stream of updates, customer guidance, and improvements available through the software dealer. In the final analysis, customer service may be what most people really will be purchasing

A more direct economic approach is to lower the price of the original. Reduction in software prices has already begun to appear and should be fostered by increased competition in the industry. Diminution of the economic incentives for copying may well reduce its incidence significantly. So predicts the chairman of Apple Computer.

APPLYING COPYRIGHT TO SOFTWARE

Insofar as copyright is resorted to as a means of protecting sortware, three traditional requirements must be considered. Subject for copyright must customarily possess originality, fixation, and intelligibility. Originality certainly has a role to play. We do not want to be protecting programs that add noting new. Originality is the least that must be asked as grounds for granting the privilege of protection.

As for fixation, this traditionally requires a tangible medium which electronic communication is not. So new definitions are needed to replace the conventional conditon for fixation.

With respect to intelligibility, in a precedent-setting case many years ago a piano roll was judged unsuitable for copyright protection because it was not readable. Object code in computer software is not readable, yet most would agree that it deserves protection. Similarly, the design of a computer chip warrants protection, even though one cannot understand the design just by looking at (reading) the chip.

Assuming copyright protection suitably modified and redefined is to be applied routinely to software, there arises the issue of user fees. There is no charge to read a book watch a video cassette, or listen to a record borrowed from its owner or the library. Should there then be a charge to use a program made accessible to the user by its purchaser?

A different answer may apply to information retrieved from a data bank. It is not unusual for an original purchaser of data to add value to it through compilation and analysis. Such intermediation can be the basis for very productive and useful businesses. The rights of the compiler or analyzer of data must not be ignored in the haste to uphold the rights of the original source or those of the ultimate user.

These are some of the issues that must be re-examined in any serious attempt to apply copyright protection or find other viable approaches for safeguarding the new intellectual media.

BOTTLENECKS

Ithiel de Sola Pool thought about these problems a great deal. He defined the concept of bottlenecks of production and distribution where controls could be imposed, and drew attention to the need to identify such bottlenecks for the new media. In print publishing, there is the printing press. The copies coming off a printing press are tangible and countable. The machines themselves are large and relatively few in number. They provide conspicuous points for exerting control. Similarly, large studios and manufacturing plants are key, highly visible points of activity in the case of records, movies, and videodiscs. They also lend themselves to the introduction of control.

What will be the activity points and bottlenecks for the post-print society? Much of the confusion stems from the inability to identify them clearly at the present time. The medium is changing rapidly. There are few solid anchors. Copyright, rooted in print, is in danger of becoming a Rip van Winkle in the era of the electronic computer.

With computers, publishers lose control. Even the hard copy count of copying machines is no longer available. Electronic publishers and distributors of electronic data have no satisfactory means of tabulating the number of times non-tangible copies of their material are used, displayed on a VDT, or printed out in hard copy form. Every personal computer and every computer printer is a potential copying machine. The problem will get worse as computer memories using VLSI chips become larger and cheaper, and as network interconnections for users expand, becoming more streamline and more simplified.

Some people believe that the way to deal with the increasing problem is through indirect rewards and non-market means of compensation. In other fields, painters do not get royalties each time their paintings are sold and displayed by the owners of the paintings. They are compensated through fellowships, prizes, and private funds. Scientists and scholars are not remunerated each time they contribute to their discipline. They receive honors and promotions at their universities, as well as consulting and lecture fees.

University projects and research laboratories typically work without royalties, and libraries in other countries pay a flat fee for the right to provide unlimited copies to their users. In the United States, cable systems pay to gain unrestrained access to distant signals. Such precedents may provide the elements from which to forge appropriate solutions.

The new computer-communications environment has a great need to incorporate simple information systems into larger intergrated systems. Mechanisms for protection should not be allowed to impede this vital constructive process. There should be innovative ways to think about protection and compensation in the context of linkages between software and user functions. Such linkages are appearing more all the time with banking, shopping entertainment, legal assistance, health care, and a wide variety of other business and consumer services.

Within the linked information structures, directories are likely to gain increasing prominence. The computer-communications environment of the post-print, information-abundant society will require them. Created to identify services and indicate where they are available, directories could provide a key bottleneck or activity point from which to apply controls.

Directories are but one type of facilitating function that will be emerging in growing number. It is good policy to encourage the development of such value-added services. They could become a principal avenue for reimbursement and royalty payments.

CONCLUSION

These, then, are some of the key issues that need to be considered. First, the idea of intellectual property must be re-examined in light of the purpose and nature of such works of technology as software and chips. Second, the significance of copying should be rethought. Third, the role of services and support in the marketplace must be recognized, and the possibility of invoking these functions in providing protection and compensation should be fully explored. Fourth, the boundless versatility of technology should be employed to develop new mechanisms for assigning monetary rewards to access and use.

One final issue that deserves mention has to do with the period of protection traditionally offered copyright holders. Because of the dynamic nature of the computer industry, 15 years, 17 years, or the life of the author may not be appropriate. For software, a much shorter period is probably all that is required. Three years may be more than adequate.

Overall, we need to look at the purposes the new media fill and the interests served by compensation and protection. In doing so, we should not be bound by the precedents of copyright and patent law, even though the social and economic objectives underlying these laws may guide us.

The ascendancy of the computer parallels the ascendancy of knowledge workers in society. Today, over half of all working Americans are directly involved in the processing of information. The proportion increases each year. Knowledge workers may be likened to farmers and factory workers in years past. Farmers were aided by harvesting machines, manufacturing workers by heavy industrial machine. Knowledge workers are being aided by the computer.

The computer was fully inducted into society in 1982 when Time Magazine named it Man of the Year. The computer is an engine of change. It is not itself a medium of communication. Rather, it provides an environment for other media. Through electronic publishing, for example, once very different communication media are now merging and emerging in new forms.

Newspapers, magazines, and books once provided almost all of the information available to the general public. Today, they produce less than 18 percent. Americans now consume over four times as many works electronically as they receive in print. Even newspaper and magazine copy is composed, stored transmitted, and printed electronically.

We are at a turning point in the move to computer-communications. As in 17th and 18th century England, the legal precedents established in coming years are likely to become norms governing information distribution in future decades. This poses an obligation and a challenge. The present generation must think clearly, judiciously, and boldly about the issues and opportunities of the new electronic environment. Wise and innovative legislation is needed for the computer industry to maintain its innovative nature and for democratic societies to preserve their independence and freedoms.*

[Applause.]

Mr. KEPLINGER. Thank you, Dr. Greenberger, for your stimulating comments. At 9:00 we'll resume our program again in the ampitheater with the beginning of our panel discussion to explore the exciting and important policy issues that arise from the technology that you heard discussed today.

Again, let's all say thanks very much to the people who provided very kindly our demonstrations today and Haines Gaffner who provided us with overview for the sessions today.

[Applause.]

[End of proceedings as recorded.]

SUMMARY OF PROCEEDINGS

Day 2: February 5, 1984

A SERIES OF PANEL DISCUSSIONS ON THE FUTURE IMPACT OF TECHNOLOGY ON INTELLECTUAL PROPERTY

Panel Discussion I: Information Processing in the Future—Joe B. Wyatt, Chancellor, Vanderbilt University; Frederick Weingarten, Office of Technology Assessment; Christopher Burns, Executive Officer, Christopher Burns, Inc.; E.C. McIrvine, Manager of Advanced Planning, XEROX Corp.; and Donald Devine, Chief Executive Officer, Trilog Inc.

Panel Discussion II: Publishing, Libraries, and Education—Toni Carbo Bearman, Executive Director, National Commission on Libraries and Information Science; Hon. Stephen Breyer, Judge, U.S. Court of Appeals for the First Circuit; Karen Hunter, Planning Officer, Elsevier Science Publishers, B.U.; Joseph P. Lash, author; Jay Luker, Director of Libraries, Massachusetts Institute of Technology; and Warren Spurlin, Deputy Superintendent, Sarasota County, Florida.

Panel Discussion III: Mass Media Distribution: The Future—Harvey Zuckman, Director, Communications Law Institute, Catholic University School of Law; Bryan L. Burns, Director of Broadcasting, Office of the Commissioner of Baseball; Mel Harris,

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*Many of the ideas in this talk are based on the writings and thinking of the late Ithiel de Sola Pool. See, especially, Pool's Technologies of Freedom, The Belknap Press of Harvard University Press, Cambridge, Massachusetts, 1983; also, Pool's posthumous paper on electronic copyright in Martin Greenberger, ed., Electronic Publishing Plus: Media for a Technological Future, Knowledge Industry Publications, Incorporated, 1985.

President, Paramount Video; Gustave M. Hauser, Chairman, Hauser Communications; William Lilley, III, Vice President, Corporate Affairs, CBS, Inc.; and Clyde Washburn, Chief Scientist, Earth Terminals, Inc.

Panel Discussion IV: Administration of Rights in Copyrighted Works in the New Technologies—Paul Goldstein, Stanford University School of Law; Thomas C. Brennan, Chairman, Copyright Royalty Tribunal; Harlan Cleveland, Director, Hubert H. Humphrey Institute of Public Affairs, University of Minnesota; Alexander Hoffman, Senior Vice-President, Doubleday & Co.; John Kernochan, Columbia University School of Law; Paul Weiss, Rifkind, Wharton & Garrison, and George Willoughby, Vice President, King Broadcasting.

Rapporteur's Summation—Paul Goldstein.

Dinner speech—"Trends, Development, and Projections," Frederick Pohl, writer.

TRANSCRIPT OF PROCEEDINGS

INFORMATION PROCESSING IN THE FUTURE

Mr. GOLDSTEIN. Good morning, everybody. If we can be seated, we have a very full program today, and the sooner we can begin, the more knowledge we can all gain from the very illustrious group of panelists that we have.

Yesterday, we all had the opportunity to look over the various types of technological devices that are more and more becoming a part of our lives. We then built upon those technical demonstrations with the stimulating presentation last night by Professor Greenberger. And now, we continue that process with four panel discussions focusing on these various issues.

The first panel concerns information processing in the future, and I have the pleasure to introduce our moderator.

Joe Wyatt presently is the Chancellor of Vanderbilt University. Before joining Vanderbilt, he was Vice President of Harvard University and is the co-author of Financial Planning Models for Colleges and Universities. Finally, he also is a member of the Advisory Committee on Information Sciences and Technology of the National Science Foundation. And I think we're all honored to have Joe join us and I'm going to turn the podium over to him now.

Mr. WYATT. Good morning. I will take little of your time except to introduce the panelists very briefly, tell you who they are. I'll introduce each one individually before they speak. Our topic is Information Processing in the Future, certainly a broad and deep topic. Yesterday, we gained some perspective on the topic generally, and we each had an opportunity to gain some personal experience at the demonstrations, a remarkable experience indeed.

The view of the future that will be taken by the panelists is each from his own perspective around the design, development, application, ownership of computer communications hardware and software and, of course, the processing of information. This is an area that has had a brief, robust, and rather remarkable history, and each of these gentlemen has a view on it that I think you will find most valuable.

The panelists are Christopher Burns, Executive Officer of Christopher Burns, Incorporated; Donald Devine, Chief Executive Officer of Trilog Incorporated; Ted McIrvine, Manager of Research and Development Planning in Xerox Corporation; and Frederick Weingarten, Program Manager of the Communication Information Technology Program at the Office of Technology Assessment. We will have each of the panelists speak for about ten minutes, and after that we will have a discussion, entertaining questions from you and from the panelists.

Our first speaker on this panel is Rick Weingarten. He is now Manager of the Communication and Information Technologies Program at the Office of Technology Assessment. Before that, he was Program Director in the Computer Sciences Section of the National Science Foundation, Director of Computing Services for The Claremont Colleges, and has worked at the Lawrence Radiation Laboratory in the Jet Propulsion Laboratory. He has a bachelor of Science degree in engineering from Cal Tech and a Ph.D. in mathematics from Oregon State.

Rick?

Mr. WEINGARTEN. Thank you, Joe. I want to first thank the Copyright Office for inviting me to speak here. I must say that as a staff member of a Congressional agency, I feel it more appropriate that I sit out there and learn from this meeting tha sit up here and play the role of expert. I assume that the reason I've been asked to talk is that the Office of Technology Assessment has been asked by both the House and Senate Judiciary Committees to do a study of the impacts of information technology on intellectual property law. We are currently formulating a proposal that we expect to go to our Technology Assessment Board, of which Senator Mathias is a distinguished member, in about a month.

Now, at that stage of the process, we're not worrying about answers. We're not even thinking about answers. What we're worrying about are the questions. How does one think about the relationship between information technology and intellectual property law? The linkage is not direct. Copyright law, patent law, are not technology laws as such. They deal with something different; they deal with something abstract, intangible.

At the same time, it's very clear that technology is a major force raising critical issues for these committees.

So I would like to spend my time talking a bit about the question stage, exploring how we think about the relationship of technology to intellectual property protection. The first point I'd like to make is that somewhere in between the technology that you heard about yesterday and will hear more about today and explored in the exhibits, and the law and the policy issues that we're grapping with, is an intermediate step. There are a number of institutions, market organizations, and cultural values, that affect the way the technology is used, which in turn affects the kinds of stresses that are placed on the system of intellectual property protection.

Let me go back a little bit into history to illustrate that. Currently, as you heard last night at the banquet speech, the protection of software is of major concern to the software industry. Well, 30 years ago, when computers were first entering the marketplace, software was free. IBM and the other computer manufacturers gave software away if you bought their machine. Users, faced with these complex, new, incomprehensible devices, were left on their own to develop the application systems that would make the computers do the work they wanted them to do. And, in response, a cultural social value of sharing, or cooperative effort, arose. In fact, the IBM users group was called "Share." Programmers from computer centers would get together, exchange code, and exchange tips and ideas on how to develop the software packages that were needed.

In the 70s, two key events occurred to change that picture. In early 1970s, the Justice Department told IBM that bundling the software together with the hardware was in violation of antitrust, so the "unbundling" decision that took place in the early 1970s separated software out as a commodity that was sold by IBM or by any other manufacturers along with the hardware.

The second event took place in the 70s and early 80s. This was the explosion of the micro-computer market. Instead of a market of a few thousand, we had several million computers out there. And most of those computers now use software that is purchased from retail stores or mail order or whatever.

Suddenly, there's an entirely different process of exchanging computer software in our society, and it's that new process that creates the demands for protections of that as intellectual property, and I would submit that it's the conflict between this new marketplace and a deeply held tradition of sharing in the programming and computer community that's causing some of the problem that we have labelled "piracy" recently.

But this is also an example of how it's not the software technology that creates intellectual property problems, its the way that technology is used and brought into the marketplace.

It seems to me that there are five questions we ought to ask about any technology, five characteristics that we need to identify in order to understand how it's affecting intellectual property. 1) How will it affect the creation of information products, 2) how does it affect the marketing of information products, 3) how does it affect the distribution and dissemination of those products, 4) how does it affect the use, and finally, 5) how does it affect access—the public's access to information. I don't think there's anything magical about those five categories, but I'll throw them out as something to at least think about.

Let me give you examples of each of those five categories. In the creation of software, software engineers are working as hard as they can to find tools that can be used to shorten the step between the conceptualization of a piece of software and its realization in a program. Now, artifical intelligence experts tell us that within a decade they'll have what they call "expert systems," which will provide intelligent help, guidance, from the computer to the programmer or to the person trying to develop code to produce more sophisticated information products. That may have strong effects on what the producers of these programs need to have protected.

If it's a simple and very economic step to move from the original concept to a new program, rather than the laborious, time-consuming task it is now, then protecting the end product may not protect much. There may be increasing pressure to protect the idea rather than the product, which raises enormous ramifications.

In the area of how technology affects the market, broadcast television has developed a system, which a very profitable business, is distributed for free. This system is partly driven by the nature of broadcast technology. Once the program goes out from the antenna, the producer or seller of it no longer has any control, so there's no way of getting a return; in the past there was no way technologically of getting a return from the recipient. The system of advertiser support in some sense had to develop to compensate for this technological limitation.

New technologies are changing that. They will allow the producers and disseminators of information to control it much further along the path of dissemination. That may have ramifications on intellectual property law.

How does the technology change the way information is disseminated? One of the trends in the technology is towards an international communication system. For example, satellites don't observe national boundaries very well. On another front, engineers are inter-connecting all communication systems in the world together into one single network. Those trends creates stresses on the international copyright agreements between nations, as I'm sure we're all aware.

The video cassette recorder is an example of how technology affects the way information products are used by the person who receives them.

And, finally, we come to the question of access. I don't have a good example of this, except to point out that the three major mass communication media in the past: radio and television broadcast, newspapers, telephones have all provided us as a society with what is equivalent to "universal service," service that is either very low cost or free.

Some of the new technologies coming along, like videotext, appear to be focusing on very narrow and very high income markets. If that's true, it may be that the new communication and information media in the future will increase the gap between those who have access to these products and those who don't. To the extent that intellectual property law draws some of those boundaries, or referees in that marketplace, I think it's an important effect to consider.

Well, any scientist knows that you are 90 percent on the way to answering questions if you can identify the proper questions to ask. And I think that's the stage we're at in this area now. And I would encourage everybody, as they listen to the technological descriptions over the day, to think in their own minds what the characteristics of the technology are that are going to affect the policy.

Thank you.

Mr. WYATT. Thank you, Rick. Our next speaker, Chris Burns, is President of Christopher Burns, Incorporated, a research and development consulting firm specializing in business development issues within the information industry. He was previously Senior Vice President and Associate Publisher of *Minneapolis Star and Tribune*, Vice President of Planning for the Washington Post Company, and a senior consultant at Arthur B. Little, where he directed much of that firm's research and consulting in the area of new technology and its impact on the media. He is a former member of the Board of Directors of the Information Industry Association, former chair of its Proprietary Rights Committee, and former chair and member of the Planning Committee of the Board.

Chris?

Mr. BURNS. Thanks, Joe. The information industry whose concerns I've been asked to comment on this morning consist of creators, distributors, and publishers of information for scientists, economists, financial analysts, lawyers, credit managers, market researchers, and other professionals, primarily through looseleaf publications, newsletters, special reports, and a variety of electronic information services.

In 1983, revenues for this sector of the economy were about 12 and a half billion dollars, larger than either books or magazines, about the size of the whole television industry, half the size of the newspaper industry, and growing twice as fast as the economy. Although this activity is an old one—as a matter of fact, Abraham Lincoln was a credit reporter for Dun & Bradstreet—it's the most modern of the media, the most aggressive in its use of new computer and communications technologies, and the perpetrator as well as the victim of much of today's copyright confusion. We're the ones who, having successfully pried the expression free from traditional books and pamphlets so that it could be sold more efficiently, are now learning to extract the pure idea from an expression and we wonder what laws, if any, will ultimately govern what we're doing.

We are caught, as you are, between a commitment to the free exchange of ideas, which is the flower of our civilization, and the business notion of secure property, which makes that civilization prosper. The law no longer provides the unambiguous guidance that information companies need to avoid injuring each other during the rapid expansion period ahead, and we fear that it may no longer even be capable of prescribing a fair remedy.

Consider how the industry derives and compiles new products and services from existing ones. An original report, well researched and perceptively written, often becomes itself an event to be reported. A Wall Street research report, for example, will create news. It will get quoted in the newspaper, picked up by a market newsletter, and circulated by clients who find the information valuable. While all this is meant to enhance the distribution of important ideas, it often ends up eliminating exclusivity which was the one advantage the research firm intended to provide its clients.

Meanwhile, an abstracting service writes a brief summary of the newspaper article and mails it to subscribers, even as an on-line financial wire service writes another abstract of the story and sends it out over the phone. Copies of the report go into private libraries from which they freely circulate and, inevitably, the full text of the original report makes its way into the hands of a competing research firm which then prepares a larger market study using these findings as the keystone.

None of these efforts quote very extensively from the original material. Prose style is not the essence of the value here. But all of them try mightily to capture the central ideas. In due time, a new publisher strips the market forecast numbers from the abstract and includes them in a data collection which is then sold to major corporations and to other investment analysts. The wire service abstracts are added to an on-line data base which can be accessed more easily by future researchers. An enterprising subscriber to the data base signs on, starts up a search, and records it on his floppy disk—which we've learned to call "downloading"—and in time, he transfers the content of that disk to the company's central computer archive where others can retrieve it.

In this very real but much simplified description of the information industry, a number of laws are imperfectly at work. In theory, all of these products are copyrighted, but in practice, they borrow liberally from each other without once paying license or royalty fees. The analyst who wrote the original report gnaws glumly on the bones of notoriety vowing next time to say something really provocative, while his employer swears to restrict future distribution even more sharply.

The journals that quoted him are emboldened to be more specific and more comprehensive in their coverage of such reports and the abstractors who feed on the journals resolve themselves to take even bigger bits next time. In fact, there is no protection.

A few years ago, this subsidiary distribution took time; sometimes it took months, during which the original audience had an information advantage over those who were getting it secondhand. But today's technology allows us to abstract the New York Times, for example, and make it electronically available for browsing or for systematic searching by 8:00 a.m. the morning of publication. A market research study can be abstracted or summarized and stored in computer memory within hours where anyone with a PC and a password can benefit from its advice.

The law says that derivative works require permission of the original author, but the definition of derivative is ambiguous in this context, leading us to believe that rigorous abstracts, like brief plot summaries, may not be among the author's exclusive rights. And that old standby, fair use, now seems to cover a number of forms of re-use, even those that might erode the market for future sales. A family that can take a movie off television is less likely to buy that tape in the future. If a subscriber to an on-line economic data base retrieves the U.S. economic model from 1972 to 1982 for all the industries in his SIC code and records that retrieval on his disk as he does it, is that fair use?

Even the copyright procedure for a data base seems difficult and inappropriate, since the copyright seeks to protect the data set, which is ephemeral, not the rules that fashion that set into a usable form, which are the real genius of the publisher's effort.

We look for protection under various unfair competition laws and in fact there is case law, International News Service versus Associated Press, to discourage the systematic misappropriation of hot news. And yet, radio stations rip and read the press with impunity and some on-line services use others as unidentified and unpaid sources. We've developed elaborate leases and contracts that try to prevent subscribers from reselling data base access, or building compilation products in any form, but since many of the individual items of information are freely available from other sources, it's often impossible to prove that the contract was broken.

We watch usage patterns and build software in the computer system to help identify the downloader, but as a matter of fact, it's very difficult to write a contract that prevents the user from buying *too much* without appearing to contradict our own advertising.

Above all, the issue is how to encourage a rapid evolution toward more effective information distribution and access systems, how to follow where the new technology beckons, without the business damage and litigation that ambiguous laws seem inevitably to reap. In the cases I've raised here, we're concerned not with the artistic creation of a work or even the costly invention of a new chip or a software package, but with the commercial process of using new technology to increase access to ideas. I'm beginning to suspect that the copyright law may not be the best legal tool for achieving the regulation we want, but that commercial laws like misappropriation or unfair competition may offer us a sounder and simpler foundation.

In France, in Germany, and in Japan, the governments are actively encouraging the development of new information access systems because they believe that these systems will improve health care and education, accelerate relevant scientific progress, and make industry more productive. We also believe that. But, in our case, we are not asking for interest-free loans, massive public investment, or a ministry for industrial growth. We're asking for laws that acknowledge a new technological reality that strikes a better balance between property and the public interest. We're asking for laws that we can understand.

What is derivative work? What is it about a data base that we're trying to protect? The data itself, or the recipe that forms it, maintains it, and presents it? What shall we agree are the customary first sale rights when it comes to information, and what's fair use in this context? There are other questions, more mundane, more procedural, but just as knotty. In fact, there are too many questions. They can be resolved in legislation, or they can be resolved in the courts, and we're resigned to a little of each. But we applaud the third alternative, which the Library of Congress and the Copyright Office has begun here this weekend, the possibility that we can craft some preventive guidelines that, with your help and counsel, we in the information business who are on all sides of this issue can get some lines painted on the track before the sound of crumpling fenders gets to be too much of a distraction.

Mr. Wyatt. Thank you, Chris. Our next speaker is Ted McIrvine, Manager of Research and Development Planning at Xerox Corporation. Ted has had a 25 year career in the industry as an applied physicist, a research and development manager working for companies such as General Atomic at San Diego; Ford Motor Company in Dearborn, Michigan; member of the Governing Board of the American Institute of Physics. He earned a Ph.D. in theoretical physics at Cornell University in 1959. Ted?

Mr. McIrvine. More than 15 years ago, at Xerox, the prospect of a future paperless office appeared to us as a potential threat to the photocopying industry. If there were no paper originals in the office, there would be no paper copies. We therefore established business ventures and also began research in an extensive way into the computer and communications fields and, as a result, we have had now internally, beginning in the Palo Alto Research Center and spreading from there throughout research and into the administrative offices and corporate headquarters, we've had now 12 years of experience utilizing a large network-based set of personal computers. Obviously, we were using them when they were not economically viable, but where we were subsidizing it is order to learn from that experience.

Ethernet is now our commercially offered Local Area Network, shared as a standard with several other companies. The Xerox 8010 Star is a professional work station offering that arose out of that work. So the things I'm going to say really result from the research precursors of that activity. And from that experience and from our study, I'll offer two summary observations. The first is that the use of paper will increase and not decrease as a result of the new electronic technologies. The second observation is that the role of paper will change.

As Daniel Boorstin said yesterday, new technologies change the role of older technologies. They generally do not render them obsolete.

To be perfectly frank, many of us were surprised to discover the degree to which paper continues to dominate the desks of highly automated knowledge workers, but I believe we now understand why that is so and therefore, have confidence that the phenomenon is not transitory.

Before mentioning those two points, I'd like to lay some groundwork regarding visual image quality in video display units and in paper. We heard yesterday in the teletext discussion the observation that the British standard with 4,800 picture elements, was insufficient, and the NABTS standard with 50,000 pixels was pointed out as being superior. (A pixel is a picture element, or a resolvable and communicable element in a video display.) However, I think many of you who were in the display rooms noticed that the optical disk quality, for instance, of the Library of Congress system is considerably beyond that. In fact, it's on the order of a quarter million picture elements. And when I take a sheet of paper and hold it at a normal viewing distance, my visual acuity can resolve something like 10 million picture elements. So we have from the past, conditioned ourselves in our society for much higher resolution than is generally accessible in video display units.

The history of the burgeoning electronics industry, however, has been toward broader bandwidth for communication, cheaper storage, and therefore, gradually relieving from what were originally (as you may recall from the days of tabcard equipment and early computers) all capital letters. We had block letters, no apostrophes, a lot of things missing from the font. We moved from there to upper and lower case letters and full fonts, and diacritical marks, and now we're moving beyond that into techniques that allow you to have italics, boldface, to change the type font from Helvetica to Times Roman, to put in logos and letterheads, halftone pictures, and to get at much, much more detail. It is allowed economically because of the reduction in cost of bandwidth for communication, and the reduction in cost of storage capacity. And it has resulted in what we now call bit map displays, where every bit from a page is represented in the computer memory at some point.

So we're working and have worked within our office systems towards high resolution displays and something which we call, "What you see is what you get": what is on the screen is also what will appear on a sheet of paper.

We would have thought that the high resolution displays therefore might have led to less paper among our knowledge workers, but instead they use more. The reason is that people will try several different formats. They'll change. Times Roman looks like a typewritten letter; Helvetica looks as though it's coming off a lithographic press. You may want to try using some 10 point, 12 point intermediate titles so you play with these, and then print a hard copy of every one of them, take a look at it, and then decide what the document will look like. So there's a shift in the use of paper, but in fact the amount of paper is not reduced.

I'll speak briefly now about the characteristics of a VDU. I'm assuming that we have a good visual display on the video display unit in the sense that there will not be a problem with flicker. I'm also assuming a high resolution CRT; many, many bits. Nevertheless, the following problems occur. You have a battle between room illumination and reflection from the screen. If I'm going to look at the other sheets of paper that are on my desk, I need room illumination. But that light that is lighting my paper very nicely also reflects from the screen. I have a problem that I wear bifocals. With bifocals, neither lens is right for the viewing distance of the screen, so I have to keep what an optimistic calls "music glasses" at my side. I put down my bifocals, don my music glasses in order to see the screen.

Also, it is a psychophysical fact that it is difficult to focus on a self-luminous image in terms of depth perception compared to a reflected image. There are some problems with contrast ratios of 10 to 1, as opposed to 30 to 1 on paper. Also, as a baby, one learns hand/eye coordination so that if you're holding something in your hand, you can move your body freely and still retain the hand/eye coordination. If I have a rigid display, I have to position my body in order to focus my eyes on it.

So there are many aspects that mean the VDU is not quite so good. As a result, one tends to accept these limitations of a VDU only in order to gain the other advantages that come with the electronic data base. Generally this means (1) if I want to make a limited access of something which is in a data base, (2) if I want to retrieve, and (3) for interactive creation of text in word processing. I'm willing to accept those limitations because it is easier to do these other processes. But the moment that I want bulk access to documentation or if I want to browse through material, I discover that what I want is in fact a paper output.

As a result of this, outside consultants such as Dataquest are predicting a very, very great increase in VDU usage from about 390 pages per year for each information worker in 1982 to more than 2,000 by 1987, to 8,000 by 1992. (That is, each knowledge worker: professional, clerical, secretarial, will—and managerial—will deal with 8,000 screens in the course of a year by 1992.) It sounds impressive; however, paper usage is now in the office at 22,000 pages per year per information worker and is anticipated to stay approximately that, growing slightly over the next 10 years. So the predominant use in the office will still be paper.

I have said, however, that the role of paper will change, and let me just quickly mention some of the ways in which paper comes out in an office environment. Of the one trillion pieces of paper that are produced each year in American offices, 40 percent come from computer printers. About 3 percent now come from what we call "office printing," decentralized small printers or facsimile units. We expect that number will rise. The amount from computer printers will stay about fixed. At present, about 23 percent of the hard copy comes from press duplicators; primarily lithographic presses. That continues to slowly go down. Prints from xerographic copiers and duplicators is at about 22 percent and is slowly going up. Use of carbon paper is still there and NCR sets, form sets, about 10 percent, but slowly going down. Typewriters, which used to be the only way to generate the originals (other than handwritten), now produce how 2 percent and will hold about steady.

In terms of offices, the goal of office automation is not to reduce paper, because the cost of paper in fact is very minor. The goal is to perform the activities of preparation more efficiently.

Martin Greenberger, last evening, called this the post-print era and I would respectfully disagree. It's not the post-print era, but the post-Gutenberg era. The printing will no longer be done on the traditional printing press. As that changes, you discover that for the average book it costs $229.00 a page for the editorial work and $43.00 a page for the composition work, which results in about one-third of the total cost. One percent is for the printing and binding, and 3 percent for the paper. Then 52 percent is applied to the distribution and retailing.

We see a potential of reducing editorial costs in books. In our studies of office use, the comparable preparation cost runs anywhere from about $70.00 a prepared page for a technical writer up to perhaps $800.00 if he's dealing with equations. There's where the potential savings can come by using the new technologies. As we do that, we will change the balance between the creation, the editing, and what used to be called composition as a separate function. Composition will get mixed with the creation. As Marshall McLuhan said some years ago, "In the age of Xerox, every man is a publisher."

In an era where every man is a publisher, the question of control of copyright, as Chris Burns has said, is a very different matter. You do not have centralized publishing activities but decentraized publishing activities. Not only do we have a problem, as my copanelists have pointed out, from the potential of copyright violation through a $2.00 floppy copying a $200.00 intellectual property of a program. Also we will continue to have the problems of a $10.00 print or photocopy job on a $30.00 intellectual property that is a book or an electronic representation of that book.

We believe that paper will continue to play a very very large role, but that role will change to one that interacts very definitely with electronic technologies.

Thank you.

Mr. Wyatt. Thank you, Ted. Our fourth panelist is Don Devine. You've heard Don briefly yesterday. He's the CEO of Trilog Incorporated, a software data processing services company. In 1983, he was the first President of the new Microcomputer Software Association, a group that I understand went from zero to 180 members in something like a few milliseconds. [Laughter.]

This year, he is President of the Microcomputer Software Section of ADAPSO.

Don?

Mr. Devine. Good morning. When I think about how things are changing today, I often remember my grandfather. When I was a boy, I lived with my grandfather. He was born in 1870 on a farm in Elizabethtown, Pennsylvania. It a was prosperous farm. I got to know the old man very well. Like all grandfathers, he had the need to tell me how tough he had it when he was a kid, so I learned a lot about what it was like growing up there.

Of course, they didn't have central heat. They didn't have any telephones. They didn't have any electricity. Even though it was a propsperous farm, there was a pump in the side yard for water. They had to bring it in by the bucket. There was a small little building in the back with a half moon on the door. He was already a mature adult when the Wright Brothers flew at Kitty Hawk. He saw the beginnings of aviation, and when I think about my grandchildren, I think they're going to see it commonplace for people to take their vacations on the moon.

When my grandfather was six years old, Alexander Graham Bell created the first experimental telephone. He saw the beginnings of the communication revolution. My grandchildren are going to have access to a hand-held portable worldwide instantaneous communications device, be able to call up anywhere, any continent, any person, from wherever they are. They'll be able to transmit pictures, words, data, voice, graphs. It'll be a computer in its own right. They'll talk to it, and it will talk back to them. There is a lot of changes taking place. I'm in the middle of it; so are you.

Most of the changes we will be seeing in the next 50 years will depend on computers. We're going to see computers in spaceships and in planes and in trains and in boats and in toaster ovens. Already general purpose computers are in more than 7 percent of American households. We heard Dr. Greenberger last night say that there will soon be more personal computers in households than there are television receivers. The same thing is happening in businesses. There will soon be more personal computers in businesses than there are telephones; in fact, the telephones will become part of the personal computer.

These changes will depend upon hardware and software. Particularly in the general purpose computer area software makes the most important contribution. Software, together with the hardware, is the engine which will improve the productivity of workers in the coming decades in America. This is one of the most important things we need to pay attention to. Because growth in productivitiy is the means of creating growth of our gross national product.

Software is somewhat different than most other intellectual property in that it is not aimed at human beings. Whereas music books, magazines and film are aimed at consumption by a human being who wants to be entertained or informed, computer software is aimed at making a computer more effective in performing work. It's not aimed at a human being.

It's been suggested by some people that the copyright law may not be the way to protect computer software because it is aimed at being read by a machine. I don't know the answer to that, but it's an interesting question.

What we need to do now in order to accomplish these advances in productivity is to create an environment which encourages and rewards people to be creative in developing computer software.

Creativity responds to market demand. In the late 40s, in the 50s, and in the 60s we saw a worldwide phenomenon where some of the greatest intellects in the world left their native countries and changed nationalities. And they came to America. They came to America because they had the opportunity to be creative here and to get the rewards of creativity which are both economic and non-economic. Both economic and non-economic rewards are important. Some of the leading countries in Europe were so concerned about this migration that their governments spent a lot of time working on how to solve the "brain drain".

We need to make sure that we have an environment which encourages creative people to build software because software is the engine for improving national productivity. In order to do this, we need adequate protection.

I wish I was able to tell you how to do this, but I'm afraid I can't. The problem perplexes me. I understand the question, but I don't understand the answer. The only answers I've heard suggested so far are answers that a mathematician would call necessary in that they would contribute to a solution, but insufficient in that they do not force a complete solution.

The real costs associated with software are the development of the product and the development of the marketplace, as Dr. Greenberger said. The cost of duplicating the software is insignificant. We had a demonstration yesterday of how readily available commercial software will break the copy protection schemes used widely today to protect software.

We may get an effective technical solution eventually, but we're not likely to get it soon, in my opinion. I think it might be more than a decade before we get an effective technical solution. That is the decade in which we're going to see a great proliferation of personal computers throughout homes and businesses. That's the decade in which we have to be most careful about establishing behavior and expectations. We must not let it become acceptable behavior to pirate software. Otherwise, we'll never stop it a decade from now.

There are three types of software pirates, as Dr. Greenberger talked about them last night. I would like to mention them again now, but simplify them a bit. But before I do, I'm always intrigued with words. Why do we call these people pirates? You know, some people in America have a romantic image of pirates. They remember the motion pictures of the 40s and the 50s where the pirates were the good guys. I don't like calling these people software pirates. They're really a lot more like burglars. As I said, they fall into three categories. My categories agree with Dr. Greenberger's.

The first category is in the home, people are making copies and giving them to their friends and their relatives. This is a carry-over of the way they use photocopying machines with written copyrighted works. The *Betamax* decision may encourage this behavior. We should be concerned about it. Concerned about it because it creates an image of acceptable behavior in the community and once that's established, it is very difficult to change.

The second group is in business. It may be an act of management omission; that is, the absence of a policy against burglarizing software, or an act of commission, where they say, "Look, let's buy one copy. We have 150 people who need it; we'll make 150 copies." As a result of commission or omission businesses are illegally and improperly copying software and using it with their own enterprise to help them run their own business. We should be even more concerned about this violation than we are with the first category.

The third category is where a company essentially is counterfeiting the software, repackaging it in some way, and reselling it. Enforcement is the principal problem in this third category. The first two categories are much more complicated to resolve.

We should treat each of these three categories individually; that is, somewhat differently. The personal computer software industry is a new one. It is coming to grips with what it should do. It's a young industry, it's learning, and it's maturing. For example, last year the industry encountered software rental for the first time, and didn't know what to do about it. The industry still doesn't know what to do about it, but the first sale doctrine is of concern to us, obviously. We're reacting in other ways. Dr. Greenberger said last night, some companies have 150 potential users in a single department and these potential users don't want to pay 150 times the retail price for a piece of software. In response to this the software industry is beginning to develop volume discounts and site licenses. There's evolution taking place.

However, we have tried every one of the technical approaches to software protection mentioned last night by Greenberger, and none of them worked satisfactorily. We don't have an effective technical approach. They can all be overcome. They're all inconvenient, where the customers don't want them or for some reason that they don't work well enough.

I've made a couple of points today. Perhaps the most important point is that education is a key. It's necessary, but I don't think sufficient for us to educate people that software piracy—software burglary—is in fact inappropriate behavior.

I've indicated that personal computers are proliferating. It is incredible the rate at which they're proliferating.

I've pointed out that software for these personal computers is the engine to increasing America's productivity in the coming decades. Through our actions as a nation, not just as a Congress, but as a nation, all of the people, the industries, the schools and universities, we need to create and maintain an environment which encourages and rewards the creativity of people in making new computer programs. This is our best route to increasing national productivity.

QUESTIONS FROM THE AUDIENCE

Mr. WYATT. And the balance of our time, ten to fifteen minutes, for questions from the audience. Yes? Hello Martin how are you?

Mr. GREENBERGER. I'd like to respond to Ted. I appreciate your offer to replace post-print with post-Gutenberg, but I've been sitting here thinking about that. I think I prefer to stay with post-print, for two reasons. First of all, if by post-Gutenberg, you mean post-hot metal, we're already there. So it really doesn't characterize what's really going to be different about the way we do business in the future as opposed to the past. By post-print, I think I make clear—at least, I tried to last night—I wasn't talking about the elimination of print, and certainly not paper; I agree with you 100 percent. It's increasing in volume, and that will continue. And certainly not the market for xerography. But simply the dominance of print in the way we get our information and perform our activities and, of course, most relevant to our subject at this meeting, the dominance of print in the thinking about the need for protection and how the best way to implement it and enforce it will be.

The point I was trying to make with that phrase is simply that we're going to have new criteria that will be replacing the copyright law that has been rooted in print in past years.

But I appreciate the point you were making, also.

Mr. MCILVINE. I think we're very close. There is always a pace of change, of course, and I was intrigued about two weeks ago to receive an electronic mail message which very proudly was being sent by someone in Britain to every electronic mail service he could find. Martin probably also got a copy of it. There were 62,700 recipients of this message. The following day, I was in a meeting with the head of the Gannett Electronic Task Force, who happens also to be the publisher of the Sioux Falls, South Dakota, Argus Leader, a newspaper which has a Sunday circulation of 65,000. It's going to be a long time until we can reach such broad distribution. The newspaper business, while it will change, is not really in danger of evaporating overnight. The only growth area in the magazine publishing last year was in computer magazines.

It turns out that electronic media, in fact, increasing the amount of print-based activity that goes on, and I think that there will be a continuing role because of the economy of mass distribution for the paper medium.

Mr. **Wyatt**. Yes?

Mr. **Berman**. Jerry Berman, from the American Civil Liberties Union. This question. For the last day and a half, I've heard a lot of talk about piracy and the need for new protection in order to—so that there will be an incentive for people to create software. I have heard no statistics, no evidence, no case studies of anyone stopping producing software because of piracy. In other words, it it—who, where is the damage to the incentive structure. Who's going out of business? Who's losing money? Who's not being rewarded enough to show—to keep the arts, sciences, progressing in the area of the new technology?

Panelist. There's two things that are happening. There are some companies that are suffering economic loss from software piracy of existing products. There are no really big companies yet in the software production business. And we have seen some companies, like—I'll use Micro-Pro as an example. It's a company which decided not to put a copy protection algorithm on its disks and they have had—they're suffered some problems. Some of it might have been management problems and some of it might be because they are losing markets. It's hard to tell. When a company starts having trouble, what really is the trouble? Is it in trouble because it didn't manage itself well, or is the trouble because it's suffering from software piracy?

And let me give you the second aspect of it, which is different than the way you directed your question. The cost today of building a new piece of vertical market application software that might have run on a mainframe but could run on a personal computer is probably on the order of $2 million. Roughly. And there are a lot of people out there today who are saying, "I understand this. I could do it." Whether they're companies or entrepreneurs. And now they're asking themselves the question, "Where am I going to get the money to do this?" And, granted, that most of the venture capital money in America today may be in computers and software, they're still finding, when they go to their bank or when they sit and think about it themselves, there's only 30,000 prospective people out there, they're relatively small businesses. Dare I build it? Will it get away from me? How will I ever get my $2 million back?

And I'm sure there are some decisions that are being made today which are causing people to hold back.

Response From Audience. (Inaudible.) I think the answer can't be that elusive. Because you're talking about extending monopoly protection or of giving new kinds of licensing protection for software, and you're saying maybe there is some disincentive in the market. I think you really do have to say that someone wants to develop software and he can't get a bank loan because he can't get a return on that investment because everyone knows it's going to be pirated and he'll never recoup the $2 million.

Panelist. I don't have a specific example for you, but I can probably get one.

Response From Audience. Well, I think Congress is going to need some.

Panelist. That's fine. Someday, I'll volunteer to testify before Congress with a concrete example, but I don't have one of those right here with me today. Nonetheless, it is a serious situation. Let me just give you two statistics which are questionable, which is why I didn't have them in there before, because we can't seem to do definitive research to prove these statistics. Very elusive. When you ask people if they're breaking the law, you don't get good responses to your surveys. [Laughter.]

But Visicorp has done some serious studies and they believe that there are two illegal copies of their products for each copy that they've sold. And some of the game software people, entertainment software people, believe that there are 30 illegal copies for every copy they've sold.

Now, in the Visicorp situation, that might actually represent lost revenue. In the game situation, it does not because if they had to pay the full price of the game, those 30 copies would not have been purchased.

Mr. **Wyatt**. Chris, you had a comment on this. It's a very provocative question. It's a fundamental question, I think, to this discussion.

Mr. **Burns**. And it's made more troublesome because if you search the past for anything like this to give us a model, you end up facing the library and books. And we've been selling books to libraries for hundreds of years and libraries circulate that, and we've never referred to it as piracy. We've never sold books to a library at a price higher than we'd sell it to individuals. It's an accident of history that we began with libraries, because printing a book was so expensive and so difficult to do.

And now, in the software business, we seem to be going at it in the other direction, and saying, "No, we don't want libraries in this case."

Mr. Wyatt. Just a personal reaction to that question; that is, after having spent the last 8 years or so in the venture capital area, and participating in, say, fifty venture capital investments, about half of which were software, I did not see any effect from the venture capitalists of fear about the current situation; that is, trade secret protection seemed to be the way people were relying on protecting their software. But I saw no investment that was not made because of concern for piracy. That may not be conclusive.

Response From Audience. Perhaps just one other side of it. The Visicalc demonstration yesterday, where he was showing how it's easy to pirate that software. And what he said is that what we keep doing is upgrade that ———, and that keeps our market going. So, in one sense, he was ironically saying that pirating was leading to more progress and more development and more investment (inaudible).

Response From Audience. I think what he was saying is that he's upgrading his copy protection technique, continually, in order to circumvent——

Panelist. I thought it was both.

Panelist. Yeah, I know he was doing both. The one he does most frequently—he doesn't release a new version of Visicalc anywhere near as often as he releases a new version of his copy protection algorithm. [Laughter.]

Mr. Wyatt. If I could just have one quick comment. I've hesitated a bit here because it's—what I'm about to say is speaking on behalf of large companies, and generally, people are looking for the rights of small companies and new starts, which may not be so much at a threat by the lack of copyright, but from a large company point of view, as I say we have put fifteen years of research and we've come out with certain protocols. We have a potential problem between the balance of implementing new protocols; for instance, something called Interpress, which is a format for communication between the creation of documents and between printers. If we publish that, then without spending on the R&D anyone can come in with a printer and attempt to compete against us. If we don't publish it, it makes it much less useful.

So we have a business problem, resulting from some $50 million worth of investment.

Response From Audience. Yeah, I wanted to comment also on the software protection issue since I happen to handle personal computer software for a parent company. I tend to agree with Mr. Devine's statement that there isn't a hardware solution on this solution to the problem. Because one of the problems that we've encountered is that the utility of the program for the user may be seriously damaged by the attempts at protection. We have a very stringent policy of purchasing a copy for each user, so that isn't an issue.

However, one recent problem we've had is with a program that is so heavily encryped, you might say, in the manner that it's recorded on the disk, that the manufacturer is not solving operational problems because it's so laden with cross-checks and check sums and everything else that there are no simple solutions to correct minor problems. It must wait for the next revision.

The other thing we find is that it's protecting us from getting it on to our company hard disks, even though they're legitimately paid copies of the program.

Moderator. Do you have a question? Yes?

Mr. Hoffman. Alex Hoffman, with Doubleday. I'd like to just supplement something Don Devine said in terms of the importance of education and the importance of, if it is at all possible, preventing the building of a public attitude. If you look back on the experience of book publishers and periodical publishers and journal publishers, with a photocopying machine, I think one of the biggest sources of the difficulties we have now, both with the enforcement of the present law in the field of print, is that the law didn't get changed quickly enough. The question of systematic photocopying went unaddressed by the law for a long time. And by the time it finally did address it, the public, understandably, had come to take the use of the photocopy machine as a birthright. If the machine is there, you use it. And by the time the law finally came around, saying: "Well, there really must be some reasonable limits on this," people took that as an unwarranted intrusion on their right to copy whatever they wanted.

And it looks to me, from what I saw yesterday, that the problems of the software people have are, if that's possible, much worse than the problems that we've ever had. And so, if it comes to be the public attitude that it's there to be taken, that there's no reason not to, as he said, if that becomes ingrained the way the use of the photocopy machine has become ingrained, the solution is infinitely more difficult.

Moderator. Yes?

Mr. **Young**. I wonder if Mr. Devine could give us his slant on the effectiveness of some of the safeguards against burglary that haven't yet been discussed here this morning? They were mentioned last night, but . . .

Mr. **Devine**. You're talking about some of the technical approaches?

Mr. **Young**. Yes. The code words, or . . .

Mr. **Devine**. They fall into two categories. One of them is user customer dissatisfaction, and that is one of the largest categories. And we heard it mentioned here a minute ago. Once you begin putting encryption techniques into your software, and once you begin putting other hardware related requirements in, it makes the software less user-friendly and less effective, in fact, in doing its job. And the customer rebels against that. He says, "I don't want to have to always have a communications mode I'm on and always have to log into the master computer that's five to 2,000 miles away every time I want to run this program in order to make sure that you count the number of times I've used it." That was one of the techniques that was mentioned.

Another one is putting serial numbers into the machines. One of the problems we're faced with here is that it may in fact be appropriate to be selling software for a single simultaneous use, but not only on a given machine. It may be that you will have the same machine at your home and at your office and you want to buy one copy of the software and this might be reasonable, depending upon the software publisher's attitude, to sell you one copy and wherever you are, you can go to your machine, whether it's at home or at work, and use it. But if that piece of software could only be used at home or only be used at work because of the serial number on the machine, you're going to be very annoyed.

And then there's the high cost of embedding the serial number into the code.

One of the things that was mentioned is that we can also uniquely identify each copy of the software so that if we find a pirated copy, we can trace back through record keeping or distribution channels where it came from. That is largely being done, but it is largely ineffective because your distribution channels, when you go through hardware manufacturers into wholesale distributors into resale people and then the guy who sells his computer with the software on it to someone else. And then, finally, it gets pirated. So that one's a hard one.

Another item that was mentioned was adding devices, whether it be a plug-in to the joystick panels of your computer, or whether it fits into a slot in the back of your computer, which you have to take that out and carry the software to another computer if you want to use that software somewhere else. In other words, this is a transportable device which plugs in externally to this piece of hardware, which enables the computer to use it.

A few people have used that, but the problem is that the standardization, the variations that are involved in this, are so complex that we haven't believed that it was practical for us to somehow be able—if you had fifteen pieces of software, we wouldn't want you to have to have fifteen of these hardware devices; one for each piece of hardware.

It comes back to the serial number of the machine problem.

I know I've rambled a bit. I hope I've answered it.

Panelist. In one of the videogame cases, the plaintiff had a marvelous case because it turned out that in the program, when you reconstructed a chip there was something buried which would not have surfaced in ordinary use of the chip, but when you reconstructed the chip there was the identification of the manufacturer.

Panelist. Well, that technique's been used. There's also been a technique used that says after you've run the program fifty times, it self-destructs. And if you don't have it—and we know that when you register it, we send you a new version every so often. You know, those kinds of techniques are not looked upon with favor by the consumer.

Panelist. One way I've suggested, if you touch the screen, it recognizes fingerprints. [Laughter.]

Mr. **Fish**. Hamilton Fish, Jr., House Judiciary Committee. Pursuing this issue of alternative protection under the law, I guess I'm concerned about the difficulties of enforcement. And one of the things we try to avoid doing in Congress is to create laws that cannot be enforced; laws which, hence, would only bring disrespect to the law. And Mr. Devine has told us the technical means won't work, and Mr. Burns indicated that commercial law may better protect intellectual property than the copyright law, but that too would involve bringing to enforcement the problems and difficulties there.

So I just wonder that the panel thinks of the possibility of rewards for the creator other than money.

Panelist. I don't have a pat answer for that. I wish I did. But some of the things that we think are answers in the right direction.

We think education is important. That's not necessarily enacting legislation to create penalties or rules at this point, but education is something the people in the industry are doing and I think that throughout our country we should be involved in.

The second area is that we can expect that the people who own the property rights will be willing to take steps to protect their own property rights under civil law if they have adequate protection, adequate reward for doing so.

Let's take Visicorp for example. If they have two pirated copies for each legitimate sale, and they go and—and a legitimate sale's worth $290.00, let's say, and they go and they find someone who has pirated two copies of it, and as a result of all of their research and investigation, they get $500.00 of lost revenue, it was not in fact very economic for them to do that.

It may be that we can somehow structure things to make it more economic for them under civil law to get recompensed—maybe it's treble damages, I don't know. I don't have a proposal for you today is what I'm saying, but, you know, the concept is that we need to help them to be able to, in the free market, to do under the law what they should be doing, protecting their rights.

That's the best suggestion that I have.

Mr. **Wyatt.** Other comments on that question?

Panelist. Well, I don't have a specific comment on that proposal, I do know that in the history of intellectual property and Congress, occasionally the concept of the reward rather than an instrument of property rights has been toyed with. But beyond that, I don't know much.

But it does illustrate, I think, the point that it may be where we need to sit back and develop from a tabula rosa our objectives. What it is we want the instruments of intellectual property to accomplish. What kinds of rights, what kinds of incentives we want them to enforce. And reexamine the basic question of what kinds of instruments should be developed to do that. And that may be the only approach to drafting the wiser legislation that Congressman Kastenmeier referred to yesterday.

Response From Audience. I have a comment and a question. The comment is directed at Mr. Burns's remarks. You had some of the solutions to some of the problems, and I'm talking particularly about data bases right now. They're not to be found within copyright. From the very beginning, copyright has tried to protect the works of high creativity, like, say, a great painting, or an opera or a novel, on one hand; and informational works on the other.

Data bases are of a peculiar nature. As a matter of fact, they are changing so constantly; in many cases, continuously, that they are never really fixed. So it may be that we may have to indeed look outside copyright, which I think Mr. Burns referred to as commercial law. But what has been referred to is the law of misappropriation. Now, that's an amorphous doctrine. The Van Dykes didn't like it, Learned Hand didn't like it. All I'm saying is it may be that in data bases, for example, we cannot force solutions.

And, by the way, this is assuming that we decide as a matter of policy that we want to accord some kid of protection. Assuming that, the solution may not always lie in copyright.

Now I come to my question. In the case of downloading either programs or data bases or parts of data bases, the problem is common with other kinds of copying going on now by consumers in their own homes, which is to say out of sight. Assuming that some kind of protection would be given against downloading for personal use, is there any way—a systematic way of detecting how that occurs? So that it could be policed if liability were indeed imposed.

Mr. **Wyatt.** Chris?

Mr. **Burns.** Yes, there are ways of detecting downloaders. By comparing their usage to the normal use of the data base. And when you see somebody whose search encompasses the entire data base from a certain point in time to another point in time, you can conclude, and if he does this systematically, you can conclude—you than go interview the person and say, "What are you doing?" [Laughter.]

And data base publishers have excellent records on who uses the data base and with what frequency. Now, having said that, I'm not at all sure that we should try to protect data bases in this fashion. The technology will change the way we distribute data bases in the next five or six years by giving us—I envision the following procedure. That in five or six years, the data base publisher will sell the user an optical disk that contains the data base as of last year, and then he will sell him a second floppy which is the last eleven months, and then he will provide him a service that updates the data base. And by doing that, he will have avoided entirely the issue of downloading a substantial portion of the data base and we will begin to recognize that the service we're performing here is not encompilation, but an awareness service.

Second, I'm troubled by the idea of protecting data bases because in fact most data base publishers got that material free. This is not an act of artistic creation. The very best data bases in the country: Lexis, DRI, and others, are built on publicly available information. And what they've done is to build software systems that are clever and user friendly that allow people access to information that was available to them anyway.

Panelist. Well, let me respond to that. I don't want to take too much time on it. Copyright has, for a long time, protected works of diligence and industry as opposed to high creativity. Copyright, for example, has protected telephone directories for a long, long time. So that's really not a distinction. It does underline the point that the solution, assuming that you want to protect data bases, may not necessarily lie in the area of copyright where it's lodged right now.

Mr. Wyatt. Thank you. I am told that we are out of time. In fact, we are past our time. We're running on a very tight schedule this morning.

I thank you so much for your attention. I appreciate very much the efforts of the panel.

[Applause.]

Mr. Leibowitz. Let me again thank the panel and Joe Wyatt for moderating the very interesting and provocative discussion that we just had.

Because of the time limitation, we can't always have the opportunity to get to all of the questions that we all have. However, we would hope that during the reception and dinner tonight there will be more opportunities to discuss many of these issues in a lengthier period.

After yesterday, I get a little worried because of the time constraints when I hear the word download. So, hopefully, nobody will use that word any more. [Laughter.]

Before we go on to the next panel, I would just like to note some of the distinguished members of the audience that we have today. In addition to Senator Charles McC. Mathias, who is Chairman of the Senate Judiciary Subcommittee on Patents, Copyrights, and Trademarks; and Senator Jeff Bingaman from New Mexico, we have many members of the House of Representatives concerned with copyright issues. And I would like, at this time, to have the Chairman of the House Judiciary Subcommittee on Courts, Civil Liberties, and the Administration of Justice, Representative Robert W. Kastenmeier, introduce his colleagues to us.

Mr. Kastenmeier. First, I'd like to introduce the ranking minority member of the House Judiciary Committee, Hamilton Fish, Jr., of New York, who asked a question earlier. And between us is John Conyers, Jr., Chairman of the Subcommittee on Criminal Justice, Judiciary Committee; he served on the Subcommittee dealing with copyright revision during the mid-1970s, John Conyers, Jr., of Michigan.

And next to me, also from Michigan, who served the last four years on the House Judiciary Committee, is Harold Sawyer. And, at the end of the line down there, the ranking minority member of our Subcommittee and a senior member of the Judiciary Committee, a member, incidentally, who serves on the Commerce Committee as well, Carlos Moorhead, of California.

Also, in the front row is Rick Boucher, who represents the State of Virginia; from the State of Florida is Larry Smith. These are our six Members; I am pleased that the seven of us could be here this morning.

And I'd like, if I may intrude on your time, to suggest that we do need to know who will in fact be going on the plane. There will be a group going first to IBM. We'll need to know which of those persons will be on that plane; those persons who are not going to the IBM facility and are going on the plane will be picked up here.

Moderator. Thank you, Mr. Kastenmeier.

PUBLISHING, LIBRARIES, AND EDUCATION

Mr. Goldstein. Yesterday, during the demonstrations, we saw various applications of computer and video disk and other technologies in terms of publishing, their educational use, as well as library use in access. The panel we have now will deal specifically with those issues.

Our moderator for the panel is Dr. Toni Carbo Bearman, who is the Executive Director of the National Commission on Libraries and Information Science. After earning her degree—her doctorate degree in the management of information resources, from Drexel University, Dr. Bearman worked in London as a special consultant for the Institution of Electrical Engineers. Dr. Bearman also has worked as the Executive Director of NFAIS, the National Federation of Abstracting and Information Services. She is a member of the American Society for Information Science and a recipient of their coveted Watson Davis Award for 1983.

Dr. Bearman?

Dr. BEARMAN. Thank you very much. It's a pleasure to be here with you all this morning. We are running behind schedule and I want our panelists to have the maximum time permitted this morning. I also want to make sure that you all have an opportunity to ask questions. There's one comment I would like to make which I think might encourage some people in the audience. I happen to have living in my home my five year old daughter and my 75 year old mother, as well as, of course my husband. And my daughter came home from school last week and said, "Guess what, Mommy? Now we're using computers in school." She's in first grade in the D.C. public schools. She then proceeded to tell us how it compares to our Osborn at home and the Centrex Mommy has in her office. She's now about to help my mother, who's a little hesitant to use it. My mother collects angels and Amanda is going to help her catalog her angels on a micro. So there is hope, I think, for the next generation coming along.

We have a very distinguished panel this morning, and it is a real pleasure for me to have the opportunity to work with them this morning. What wasn't mentioned in my introduction is that I've been working in this field for 22 years now. I feel like a bit of an antique, but what's even scarier is thinking about working in it for 25 more, when I think of what has already changed.

Well, our first speaker this morning is Stephen Breyer. He is presently a Judge of the U.S. Court of Appeals for the First Circuit. Before that, he was a professor of law for fourteen years at the Harvard Law School. He also served as Chief Counsel of the Senate Committee on the Judiciary. He has written, taught extensively in the field of economic regulation, and he has practiced it too, in staffing the Senator Kennedy Study of Airline Deregulation. He claims that he was originally given tenure at Harvard on the strength of a single article he wrote about copyright. It's a very impressive article, entitled "The Uneasy Case for Copyright."

What we are going to do this morning, first, is hear from Mr. Breyer, who is going to present, I assume, the uneasy case for copyright in ten minutes. We are then going to hear from each of our other four panelists. The other four panelists I have asked to devote their first roughly five minutes talking to you about the applications of the technology in their area. Their second five minutes will be devoted to the implications of these technologies and issues.

We will then devote the remainder of the time to questions and discussion focusing on the issues.

Thank you.

Dr. BREYER. Thank you for mentioning the article, which I looked at in preparing for this discussion. You have a schizophrenic reaction reading an article that you wrote a long time ago. You read it and you say to yourself, "Hmm. very good, very good—darn right." [Laughter.]

And then there is an opposite reaction. As Bob Bork once pointed out, "There are many people who have written articles and books that were totally laughed at ('Prophets, Hah'). Nobody paid any attention to what they said. Then, later on, history showed that they were rightly ignored." [Laughter.]

You didn't come from Washington, the entertainment capital of the world, to hear my jokes. I have ten minutes and I'm going to make five brief points. I'm going to make these five points in a slightly controversial way. The issues are really shaded and there are arguments on both sides, but I'm going to try to be a little controversial. And the truth is, I do believe these points, but for complicated reasons, more complicated than what will appear.

My first point is that there are basically two views of copyright: what I call the "moral view" and what I call the "economic view." By and large, the courts and the law, over the course of the last fifty years, have come down quite squarely in favor of the "economic view." Now, what do I mean by the "moral view?" It's well summarized by the legendary King Diarmed, who said, "To every cow its calf." And he said figure out what it means later. [Laughter.]

The second view, is that of Macoulay. Lord Macoulay, in speaking to Parliament, said that copyright is basically "a tax on readers for the purpose of giving a bounty to authors." Now, if I could recommend that you read one thing in the history of copyright, (although I'd love to recommend my articles) I would recommend Macoulay's speech in the British Parliament. Even though it was about books, and it was given over a hundred years ago, it is topical and correct. I strongly urge you to read that one well-written speech.

What is the difference between these two views? Shall we reward the author in an amount equal to the benefit that everybody else receives from his work? That's the "moral view." Or shall we reward him with no more than the least he'll take to produce the work? That's the "economic view." Let me give you an example: The Bible. Should we charge people what the Bible is worth to them? Or would we charge them what it would take to persuade its Author to produce it? I'm using that example, because I want you to see the vast difference that there can be between those two amounts.

By and large, the courts have opted for the "economic view." I think you'll find that is consistent with broad tendencies of the law in antitrust, in economic regulation, in many areas where the law seems to fight against giving people more than it would take them to produce the product. Now, that approach is controversial. The Betamax case provides an interesting example of the philosophical debate. What did the five Justices of the Supreme Court's majority adopt? What did they quote over and over? They said that copyright law, like patent law, makes reward to the owner a secondary consideration. The primary object in conferring a copyright monopoly upon authors lies in the general benefits derived by the public from the labors of those authors.

Again and again, the majority used this type of language. The minority argued: "But don't you see, if we allow copying, the authors or the producers will receive less money?" The answer to that was: "So what?" "Lower revenue" is the beginning of the argument, not its end. There are people all over the world who are paid less than what their labor is worth. I mean, my goodness, do I have to tell Congressmen that? [Laughter.]

Do I have to tell that to judges? Think of the teacher, the man who clears a swamp, the person who invented the supermarket. Those people are not paid what their ideas were worth. What they're paid, and what they should be paid, is what it takes to get them to produce those ideas—to do the job.

That's the "economic view" and that's the view which, given the five to four majority in the Supreme Court, I think is predominant in the law today. Of course, it's up to you to say what will be the law of tomorrow.

My second point is that to apply the "economic view" requires balancing. Balancing what? Well, on the one hand, there are the evils of restricting copying; that is, the evils of requiring permissions, going through a lot of red tape to get permission to copy. It's of enormous social benefit to allow people to copy. I know this because I'm a teacher. Everything I say, I want copied. It should be copied, if anybody'll copy it. The problem is, they won't. [Laughter.]

And maybe there's even some social benefit—in fact there are enormous social benefits obtained by copying, by spreading information around, as far as possible. On the one hand you have to consider those copy benefits. What do you weigh on the other hand? I've looked at this excellent study by the Library of Congress. I don't know about its conclusions, but otherwise I think, this is a good document, a highly intelligent document which analyzes some of these problems in this area. What it says is that on the other side is minimal encroachment upon the rights of authors and copyrighters. At that point, I disagree. It is completely wrong in using the word "right." To use that word is to assume the conclusion. The question is what the content of that "right" should be. And in doing so, one must balance the value likely obtained from copying against what is on the other side. What is on the other side is the need for a restriction to bring about production. So my second point is: that need is what is in balance. We balance the harms involved in restricting, from the point of view of spreading information around, versus the need for the restriction to get the work out there in the first place. That is my second point.

Now I'll become more controversial. [Laughter.]

My third proposition: lo and behold, the balance varies from area to area. Trade books are not like textbooks, textbooks are not like computer programs. The markets are different in all of these areas; therefore, the degree of restriction that is likely to be necessary is different in all of these areas. You can't just assume analogies between them. Think of Walt Whitman sitting in the garret. You get one answer. Think of the university wanting to spread information. You get a different answer. Think of Kodak, able to produce cameras, film, without any protection. (Kodak has never obtained patent or copyright protection.) You come to a third answer.

If you work by analogy, you'd better be certain that you have the right analogy, based upon the particular economic conditions of the particular marketplace at issue. And my third point implies strongly that in some marketplaces at sometimes the correct answer will be no protection.

Take the area, for example, of scholarly libraries. The case for protection there is very weak. Why? Well, scholarly material will likely be produced without any protection. There is a good argument that it will be. The people who produce it, by and large, are on somebody else's payroll. I wrote my copyright article for tenure; I didn't write it to sell it. (Nobody'd buy it anyway). The point is that the need to protect that type of production is fairly minimal. Have I forgotten the problem of the cost of publishing it? No. The question is how to get the money to the publisher, and copyright's one way of doing that. But there are other ways. After all, scholarly journals are produced by scholars, and published primarily for the libraries. If the libraries can't copy it, the argument is that the journals don't get as much money? The answer to that is that they'll raise the price of a subscription. They'll raise the price, if necessary, and they'll be able to because the libraries want it.

What about the libraries? Is it the case that what we gain on the swings we lose on the round-abouts? Not necessarily. Because at least, even if the sums of revenue involved come to roughly the same amount, we evade and avoid all the enormous complexity of getting permissions, if we collect the revenue via higher subscription fees instead of via a copying fee imposed pursuant to copyright liability. So maybe you would lose something without copying, but you perhaps have produced a simpler system.

I won't go into the details here. I just ask you to focus on this point before immediately jumping to the conclusion that we have to have a copyright system to encourage production, to deliver the money to the producer. We need to think imaginatively about alternative methods of doing that. That's my third point. Sometimes the answer could be zero protection or near zero, though not always, and not even often.

My fourth point is about new technology. Of course, we've all heard how we have to do something about new technology, about all the new kinds of copying that can go on. Now, I don't necessarily disagree with that. But I also want to focus on the contrary point, which is that at the very same time new technology makes copyright restrictions even more harmful than ever. That may even be the primary function of new technology.

Let me give you an example. In Pennsylvania in 1910, there was a lot of stuff sitting around that was black and sticky and it was called oil. Now, suppose somebody had a monopoly on that. Well, people would have said, "What a pity. Too bad. But really, who wants it?" [Laughter.]

Now, bring into play the invention of the automobile and think about that same person who has the monopoly on that black, sticky stuff. You see, to gain all the monopoly profit from the telephone business, it's not necessary to own all the telephones. All you have to own is some little tiny bit of something necessary in a telephone and, suddenly, all the profit from the new invention can be yours. Then a copyright on an essential part of a new invention may give its owner all the profit from the invention. To the extent that there is a potential restriction, the new technology with enormous benefits creates a special risk of enormous potential harm through legal restrictions.

At least we must examine the potential for such harm before we decide, "Aha, the best route is protection."

Is the analogy to monopolies a fair one? One might say, "Well, we're not talking about a monopoly held by John D. Rockefeller. We're talking about tiny monopolies of small items. And that isn't even hardly a monopoly." But there tends to be a tendency to think that 'the practical way of copyright owners collecting money is for everybody to get together and fix their copyright royalty prices'; then, suddenly, when we start talking about blanket licensing, and clearinghouses, and so forth, we've suddenly moved over from just a tiny monopoly, toward rather grander cartels or monopolies. Here the analogy becomes a little more apt.

My final point: new technology brings new problems of copying. It also brings new problems. We should beware of too much restriction.

The reaction, in Congress, when faced with a practical problem, at least the reactions of legislative assistants, tend to be: "That's very complicated. Let somebody else do it. We'll create an agency. And in the agency, they'll figure it out."

Given this reaction, I subscribe to the following warning. What we are really talking here is about dividing up money. The human beings who can think of how to divide up money—and that's what they'll be doing once the agency's created—don't have some special gift of knowing how to do it. They tend to negotiate and split the difference to arrive at some kind of a "fair" but random method. What are their tendencies? One tendency is to say "we'll get around the problem. Since it's very expensive to collect all these little permissions, we'll simplify collection clearinghouses and blanket licensing." Then somebody says, "My god, you've created a big price fixing cartel with monopoly potential." The answer: "Don't worry, we'll regulate it. We'll set up a commission. . ." But I remember that the FTC once said, "Let's try and label house plants in case somebody eats them." That is, commissions don't always do sensible things. And here we are giving them a job that is virtually, virtually impossible to accomplish, deciding a correct allocation of money. And then we say, "Okay, don't worry about that. The Courts will be there to watch them."

Well, that's really the warning note. The courts will be there to watch them? [Laughter].

I remember what Oscar Wilde said when he read Dickens's Old Curiosity Shop. He read Dickens's account of the death of Little Nell and said, "one would have to have a heart of stone to read it without laughing." [Laughing.]

We tell the courts: "Well, you supervise how the Copyright Royalty Tribunal divides the money and see that it's right." What are the courts supposed to do? They know how to divide the money? We can't avoid the problem by saying, "Oh, we'll create a clearinghouse, we'll have a commission, and then we'll have the judiciary sitting there, and they're going to figure it out the right way." I don't think the courts have greater expertise or knowledge, or that they or any agency produce a more sensible result than Congress would by deciding what ought to be done.

So I've emphasized the problems of copyright's restrictions. I've given you the "economic" point of view. I have said what I think are the elements of proper "balance." I've given you the second of two sides, that must be considered when you look at the new technology problem, and last, I've suggested that Congress avoid asking the courts to make up a solution to the problem.

I think I'll stop. Thank you. [Laughter.]

Dr. **Bearman**. Thank you. [Applause.]

Dr. **Bearman**. Thank you very much. That will not only lead into our discussion, but certainly into Panel 4 this afternoon, which is on the administration of rights.

Our second speaker this morning is from the publishing community. Karen Hunter is Planning Officer for the Elsevier Science Companies and the U.S. Coordinator for Planning, Research, and New Business Development. She formerly worked at Baker and Taylor Companies and at the Cornell University. She has a bachelor's degree and three master's degrees, including one in library science, and a business degree. And she's here in part, representing the Association of American Publishers.

Karen Hunter.

Ms. **Hunter**. Thank you. That's an extraordinarily hard act to follow.

If Toni said she feels a little old at having been in this for 22 years, I'm beginning to feel like a dinosaur representing print publishers. I hope we are not outmoded, nor that we are something that will go by the wayside.

What I would like to do is talk, as Toni said, a little bit about exactly what do the publishers do now, how is that being affected by the newer technologies, and what issues do I see that are affected by copyright. For those of you, just briefly, for whom Elsevier is not a household word, Elsevier is a large Dutch publishing company. The scientific group that I am a part of is one of the largest, if not the largest, English language scientific publishers. We do about 500 journals and about 500 new books a year.

So what we're looking at is an international problem. We're looking at the international scientific community, the scholarly community, to a certain extent the business information. I can't speak to the question of consumer publishing.

Having said that, what is it that publishers do right now? There was a comment a few minutes ago that with the Xerox machine, everyone is a publisher. I think there's another computer related comment, if that's the case, and that's "Garbage in, garbage out." One of the things that publishers do in the very first place is to select, provide an editorial and quality control. That step means both identifying new areas for publication and potential authors, and then selecting among the various possibilities of things to be published.

We edit the material. That means both in form and in content. We design the physical format. We arrange for typesetting; in most cases, publishers are not typesetters. Typically, it's done by outside vendors. We make more corrections. We have the work printed. And, again, sometimes there's confusion. I don't mean to be condescending, but most publishers are not printers. We get them bound, we keep them in inventories, we advertise them, we market them, we sell them, we fulfill the orders, and we administer the finances.

Basically, we're a serivce organization, in other words. It happens to result in a manufactured product, but the manufacturing is done by others.

Typically, if you look at that for a written product, you're producing one at a time, and each unit tends to stand somewhat alone, and it's prepackaged for sale in that way. What's going to happen with new technologies and how is that going to affect or how is it affecting the way we do our business?

There are many ways; certainly, some of them just converting and improving upon our present practices; others that will be totally new. At the most basic level, we should, if an author has produced a manuscript, has produced a work on a word processor or on a personal computer, be able to take that electronic product in a floppy disk or in a cassette and use it directly in one way or another to enter the publishing process without having to re-keyboard it. It's a very simple idea; it doesn't work most of the time right now.

Why doesn't it work? In fact, right now, typically, if an author says, "I have my work on a floppy disk," you say, "Okay, fine. Great. Like to have it," knowing it's going to take you more time and cost you more money than to re-keyboard it. Or you'll say, "Okay, fine, but send us a print-out as well," so that you can use it to in put into the process. Largely because we don't have standards right now. We have no uniformity. If I do something on my Apple Writer II-e, on my Apple II, and I want to send that to someone else, there are black box systems that you can go in and out of converting, but there is no real standardization to make this a simple process. So right now, no one's saving much money on that. But that will come.

The Association of American Publishers, the Council on Library Resources, and others are working together to develop standards so that we will get some standardization so that we can use the electronic creations of our authors, the physical product to try and save money and speed the process.

That's a simple step. What are we going to do next? The big step that has to take place, and that's something that will take much longer among traditional print publishers, is to stop thinking in terms of producing one item at a time, one book, one issue of a journal, but to think about building or at least theoretically building data bases. That is, not just structuring one article, but structuring all of your information so that it has sufficiently common orientation and structure that you can merge it in one way or another, either with other things that you have published or with things which other publishers have published, to have a much more sensible, flexible kind of environment. What do I mean?

Let me give you an example. At Elsevier, as I said, we do more than 500 journals. Very roughly, that means that we do about 600,000 pages a year of journal literature, that we do about—we have 60,000 articles, 70,000 articles, that might involve 150,000 authors. Right now, as that material comes in, it comes into a factory, in effect, and you want to publish that information very quickly. Otherwise, it is no use to anyone if you don't get it out fast. You haven't really got time to do a lot of changes with it, nor, necessarily to think too much how it's going to relate to a journal that's done in another Elsevier office fifty miles away. You should, but you don't.

What we have to do in Elsevier and what we are doing is to make sure that we are doing each of these parts the same way so that electronically we can fit it all together if we want to, or at least that we can electronically search and access from one to another. And, ideally, we want to do it in such a way that we can go from our files in physics to the American Institute of Physics files in physics, using the same access mechanisms, and go to the American Chemical Society's files, et cetera. It's an enormous project, but the potential of what it will mean for information access is great.

So, data base orientation. Trying to structure our material in a retrievable way. And here I'm talking really still just about text. Right now, the technology is still not ready to handle graphic material, critical types of photographs the way we want. We have areas in biology, we have areas in geology, where people won't even accept a photocopy. They have to have the printed page for the quality they need in the reproduction. We're anywhere from five to ten years of having that on a widespread scale; I don't mean technically, but I mean widespread in use.

All right, so you get that far. That's still transferring present products to a different way of accessing the first product, or a different way of organizing the first product. What else can we do with technology? Well, then we can move from thinking about structure to thinking about the intellectual content. Is there a way we can link the intellectual content a little bit better? Again, I'll give an example from what we're doing.

We have a cluster of reference books in biochemistry and related areas—not just biochemistry, but in the biomedical area. We're starting to rethink these. We're not thinking of them as just books. We're thinking about them as paragraphs and as paragraphs which, from that whole group of books, should begin to come together and be accessible and relate to one another electronically. To do that, to think about how you structure the paragraph level, to think about how you link words from one—in other words, creating again a large data base among a whole lot of words means a lot more intellectual effort has to go into how do you organize your work and you just can't take a manuscript from an author, edit it and publish it, and get something that you can use beyond that hardbound book.

Ultimately, if we can accomplish some of those things, I would say probably within eight to ten years, publishers like Elsevier and some of the other big scientific and business publishers will have some electronic data bases or archives in which all of our material automatically at the time it's created is also stored electronically, even though we're also putting it on paper.

Now, I do think that print on paper will be continuing. Now, even though we print now in very short runs; in a way you can't believe the things—we print a lot of our material in 200, 300 copies, a thousand copies is not unusual. To be under a thousand copies of a book is not unusual. In the world, there are only about 500 places that want, you know, information on a particular sublevel of neuroscience or something, and there are only so many copies you can sell. So it's automatic—the cost of printing is not in itself great, but you can't sell very many copies. The high price stays there. If we could store it all electronically and if we can begin to manipulate the data file more, then we can print on demand. We can print smaller units, and we can mix and match. That's going to happen far more than it ever has in the past. We're going to be selling paragraphs of information. We're going to be selling a chapter from this book and a chapter from that book, or an article from this on demand, and available.

Now, part of that's going on right now, if you look at the copy shops that exist next to universities, where they will on a professor's request photocopy a chapter from this book and a chapter from that book and bind it all together and sell it to the students. That's something that we object to, as publishers, rather strenuously, without royalties. On the other hand, we're sympathetic to the need. The way we package information is not necessarily the way somebody wants to use it.

So one of our jobs as a publisher is to make sure that we can do the same thing. That we are able to provide the flexibility that the market demands and has a reasonable right to ask for, and that technology makes possible.

Finally, there will be, certainly, as far as new technology for publishers, the kinds of new products that have nothing to do with what we've been publishing in the past. Software's the current example. I don't know of any large publisher that isn't also trying to publish software. They're going through it with fear and trepidation, but they're trying to do it.

I should say, by the way, a comment as to one of the things that was said before as to how much information or not. Our first big software programs which are coming out now—they're being announced at a scientific conference next month—we're giving full source code. We are going to tell the person who buys it everything they could possibly want to know about it. And with the idea that they can modify, maneuver, do whatever they want with it internally on their own machines. It won't be cheap, and we're also aiming at commercial markets where we assume that Company A won't copy it and give it to Company B because they're competitors, but we are trying to do it that way.

Okay, very quickly. Implications for copyright. Interestingly, I thought I would disagree more with what Judge Breyer said than in fact I did. I agree with a very large part of what he said. Certainly, from our standpoint, and I'll come back to this in a moment, we are economically motivated to get sufficient revenues to justify going on, not everything it may be worth. That's a whole separate question, but just enough to keep us going, thank you very much.

Now, looking for a Dutch company where you can't fire anyone, it's very critical to have enough money to pay the bills. OK.

One thing on copyright now, in the new technology. It's not changing overnight for us. It's going to take time. The issues that we're dealing with are critical, but most print publishers that I know are still concerned about photocopying, they're not so terribly eager to say we can't live with the present copyright law, it isn't providing for our needs.

Second, and that's a related change, there are a lot of changes going on in relationships among players. One of the things that these electronic data bases will do, in order to make good use of them, it's likely that you'll have far more sales directly to the end user. Instead of going through a chain that goes from publisher to perhaps bookseller to library to customer, you may go far more directly to the end customer. That upsets a lot of people, including some librarians—not all, by any means, but some are not sure of what their role will be. It also upsets a lot of publishers because they're not sure they can handle that. They're not so sure someone else isn't going to step in, realistically, and take over that whole job of information practicing.

What does that have to do with copyright? Only in the sense that you're going to be hearing from various people with vested interests, including myself, and who are trying to protect our roles in the future. And I think some of the people who used to wear white hats may or may not be wearing them always, or at least, you have to be a little wary, including me.

The third thing, and I have to just stop briefly. There are people who are saying that electronic publishing makes copyright obsolete, and the example they use is what I consider the extreme example. That is, "Gee, I take and I enter a piece of work on a computer. It's on an electronic mail network. Somebody else comes by. They adjust it, they change it. Another person comes in, the adjust it, they change it. How can I protect possibly this thing? It has several authors, and it's changing in time. And, therefore—" and I have seen this too often now, from some reputable people—"therefore, electronic publishing must not be copyrightable. It must be just too hard to get a handle on."

I would say the kind of situation that's described to begin with, this electronic—iterative electronic messaging, may or may not be copyrightable. I have my feelings that there are methods that could be done, but I admit it's difficult. At the same time, no one puts a gun to the head of the person who starts the process. No one says, "You must put your information in this system in such a way that its particular identity is lost." That's choice. Just as someone who puts out public domain software makes a choice that they want to put it out and freely copy. Some of them put their choice if they go into a system like that. In order to make a choice, though, you have to be able to also put it into an electronic system where it's protected. And I don't want to see that protection lost. I think it would be ironic, in a time that we are stretching and using copyright to protect any number of different things, to remove it from the protection of words simply because they're there electronically.

The two quick points—I know I'm out of time—in addition I would make if it's all right, is only twofold. One, because they are repetitions of other things. One, it was said last night that we should perhaps focus on use somewhat more, or at least a sense of copying. Maybe not entirely true for copyright law. I certainly would agree. I think that we have to think about compensation for use as much or more than compensation for making a physical copy or an electronic copy. And what use should be compensated.

Second, and that's the big question, is investment. Building data bases is not cheap. It's costing us more to do this than it cost to print and to publish normally. The intellectual effort that has to go into it is great, and we can't do it if we don't have some reasonable expections of a return.

Thank you.

Dr. **Bearman.** Thank you very much. It's very frustrating this morning, because I want to hear all of the speakers for an hour. I only wish we had more time.

Our third speaker this morning, we're going right back to the source, one of the people whose intellectual property we are talking about. Joseph Lash is the author of eight books. In 1972, he received the Pulitzer Prize for Biography and the National Book Award. And also, the Francis Parkman Prize. He was presented with the first Samuel E. Morrison award in 1976, and he is here speaking on behalf of the Authors Guild.

Mr. **Lash.** Thank you very much for including the Authors Guild in these discussions. At breakfast this morning, Dr. Boorstin made a very important distinction. He said, "We have been talking about information, but there is a difference between information and knowledge." There is, of course, a link, and the author may be the link. And it is important, when we consider copyright, that we not operate in such a way that we protect the holders of copyright who are chiefly the vendors of information and that we forget the author.

Somebody yesterday leaned over and said to me, "Where is the author in all of this?" And, indeed, it was a very relevant question and I appreciated it because, this morning, we have heard the word "author" used by Judge Breyer, only to have the whip applied to our backs, to suggest that we are a mercenary lot and we should be made to work for whatever it takes to persuade us and the less it takes to persuade us the better off the consumer is.

Well, I freely acknowledge that we are a mercenary lot. I don't deny that. [Laughter.] I don't know whether it distinguishes us from Congressmen and judges and others . . . [Laughter.] I think perhaps we all have that kind of self-interest, and perhaps it is part of the virtue of the American system that we do have laws that protect that particular aspect of human nature.

I was reminded of Winston Churchill's statement about democracy, that it is a bad system, except for all the others, and as I was hearing some of the statements about copyright this morning, I wondered, well, what are the other systems that would work better. I think that I've been sent here—now this is going to seem to some of you, anecdotal, because I wrote my last book on a word processor. And when the Authors Guild was invited by the Library of Congress and Dr. Ladd to send a representative, they said, "Well, we'll send Joe Lash. He knows how a word processor operates." [Laughter.]

I had some other personal experiences that seem relevant in terms of the discussions we've been having here. I did a book about Roosevelt and Churchill, *The Partnership That Saved the West*, and that ended at Pearl Harbor, and my publisher said, "Well, why don't you go on and do a book about Roosevelt, Churchill and Stalin?" And I said, "Sure," and he gave me a good advance and I went up to Columbia where Marshall Shulman made me a visiting scholar so I could have use of the library, and they have a very good library at the Russian Institute, and I would read these marvellous books about Stalin and I would take them upstairs to be copied for me. The cost, in economic terms, was probably a little more than what I would have had to pay if I had gone out to get the book, except that a lot of them were out of print, but afterwards, I said to myself, "Well, now, I'll make use of this and I'll give him a footnote." And something in my mind said, "He probably would say to you, the author of the book, 'I can forget the footnote; pay me a hundred dollars for the citation,'" except that he didn't know about it, and my guilt feeling was not strong enough to make me volunteer to send him the hundred dollars. [Laughter.]

So there is a problem, of course, as we all have been acknowledging.

Well, I had the experience the opposite of that. I wrote some books about Eleanor Roosevelt, many of you may know, and we did a television program, "Eleanor and Franklin." And then somebody had the idea of doing a television program about Eleanor Roosevelt in the years after FDR's death that would focus on her human rights work. And so they went ahead and some of you may have seen that film, which had Jean Stapleton playing the part of Eleanor and doing a very, very good job about it.

Well, Jean Stapleton's agent whom I saw later said to me, "You know, I said to them, we ought to use your book, *The Years Alone*, and everybody just—they set their jaws grimly and said, we decided not to pay any attention to it." But I, of course, knowing my book very well, watched this film very carefully, saw lines that were similar. They obviously worked on the principle, this is all in the public domain and we'll see to it that it is not copied in such a way that it makes us liable to a libel suit on the thing, or infringement of rights.

So, it's both sides of the picture, and I understand that this is a very complex problem. I appreciated very much Dr. Ladd's analysis of the problem, before the World Intellectual Property Organization, because it was so sensitive and sensible about the problems of authors, and I do think that our interests tend to get lost in this very revolutionary technology that is developing, in which the money and the battalions are really on the side of the people who are creating the floppy disks and the other software, et cetera.

But it will be a shame if the knowledge part, as distinguished from the information part, is lost sight of in the situation. Someone this morning talked about the brain drain, of the migration of great European intellects to the United States after the war. Well, there was another brain drain before the war. Some very great European minds migrated to this country, fleeing from Fascism in one form or another, and their names were people like Einstein, and Fermi, and Szilard, and they were the ones who had the idea of splitting the atom, and during the course of the development of the atom project, they became very exercised at first because they felt that the generals who had taken over supervision of the project—General Groves and others—were not sufficiently attentive to the need for haste in splitting the atom and getting the atom bomb, and that the big companies that were brought in to develop the atomic facilities were more concerned about their patents after the war than they were with getting this weapon in time of the war. They were wrong, on these points, as was shown later.

But later, at the end of the war, when Fat Boy was developed, and the issue came up, should the bomb be dropped on Hiroshima, people like Szilard, Fermi and others said, "Let's do it in a demonstration way. Let's not drop it on Hiroshima." And I thought afterwards, that here were the people with the long vision, that if indeed we had not dropped the bomb—you don't want a lecture on nuclear energy, but I'm trying to get at the difference between knowledge and information, here. If these seers, so to speak, had been listened to at that critical juncture, we might have been saved this great, terrible race that we're now facing in the world, so don't be forgetful of the people with knowledge, not that I'm for a moment comparing the authors and the Authors Guild—two minutes? I haven't started! [Laughter.]

Well, anyway, with minds like Szilard and Fermi, et cetera.

Someone asked me yesterday, "Well, how many authors use word processors?" And I had to confess that I didn't know. That in the Authors Guild we have talked about it, and there are a group of authors who have word processors. They are a group of authors who are very distinguished and who wouldn't go near one with ten-foot pole because they say it interferes with the creative process, but the fact of the matter is we at the Authors Guild don't know, and we should know how many authors are using word processors, what their experience has been, and et cetera.

The publishers have set up an Electronic Publishing Project in which they're trying to get a set of standards for coding manuscripts that could facilitate the procedure of composition and putting a manuscript into the works. We are a part of the Project, we're one of the stakeholders. The assumption is that we should learn these codes when they're finally developed, and when they send back the disk marked for electronic processing, we should know what to do with it.

Well, the Authors Guild has taken the mercenary view that if the publishers are to get economic benefits out of it, they ought to share it with the authors and not load this thing on the authors, on the assumption, well, that this is the way things have gone traditionally. Indeed, speaking personally, it seems to me that if publishers want to move into the computer mode, and they would like us to prepare manuscripts on disks and send us back the disks coded by the new code they're developing, that perhaps publishers should consider that when they sign a contract with us that they also make available to us a word processing machine on which we can do the manuscript and send it to them. After all, in newspaper offices today and any of you who are familiar with a city room know this, there is a word processor at every reporter's desk. If a newspaper publisher can supply a word processing machine to his reporter, a publisher can do the same with his writer.

Well, I have—I see the time is gone. But let me just say that it is easy to forget the author, that we ought not to kill the goose that lays the eggs. Some of our eggs may not be golden, some of them may even stink, but don't kill the goose. [Laughter and applause.]

Dr. Bearman. I think the only thing criminal is having to cut short such excellent speakers. We are obviously going to go at least until 12:00 and those of you who don't mind delaying your lunch may wish to stay and ask questions. We will move along as quickly as we can. Thank you very much, Mr. Lash.

Jay Lucker is an old personal friend of mine, I'm delighted to say, so there's a familiar face to me on the panel. He has been Director of Libraries at MIT since 1975. He previously worked in senior positions at Princeton University and at the New York Public Library. He's active in many professional societies, was past President to the Association of Research Libraries, and a member of the American Library Association Council.

Mr. Lucker.

Mr. Lucker. Thank you. I'll take the two minute warning in eight minutes.

Computers have revolutionized the way that libraries operate and continue to change the ways the libraries do the things that they have to do. Just to itemize some of the impact of computers internally, the advent of computerized networks has increased the speed with which libraries can catalog information and decreases the cost, by enabling them to cooperate in the cataloging of books, journals, and other materials. The transmission of this information through bibliographic utilities also enables libraries to use that same data base to exchange information on what they own. So the same data base that reflects cataloging information provides information for inter-library loan and photocopying requests.

Within libraries themselves, computers have been used and are being used to automate the way the libraries are organized. The integrated library system is a thing of the present, where libraries now have a single computerized system to enable them to acquire, process, catalog, retrieve, and display to the users all of their holdings.

Libraries are the principal users of on-line bibliographic data bases. Libraries are using micro computers for their own internal operations. Libraries also are the purchasers and disseminators of electronic information and other new forms of technologically stored information, such as full text on video and optical disk, videotapes, audiotapes, and so on.

Libraries—academic libraries, particularly—are also part of a larger organization, usually the university, and the electronic revolution is now reaching onto the campus into what has been called the "wired campus." There are at least a half a dozen institutions that are presently in the process of wiring their campuses so that there is one large network. Three of them, Carnegie-Mellon University, Brown University, and MIT, have received large amounts of support from computer companies, such as IBM, and Digital Equipment Corporation.

The concept is that probably within the next five years, every individual on the university campus will have access to a large range of information. The information will be stored in a variety of places: the central computer facility, individual data bases, and the library. The proposal is that individuals could access the library's catalog, and could access external data bases through the library.

Now, obviously, one of the problems here is the control of the right to that information. It is unlikely that libraries will be distributing full text on the campus. People have been saying with the advent of the computer, it would be very easy to send somebody the information that they want. Well, with four million items stored in our library, for example, it's uneconomical in my view to transmit full text that is not already in electronic form to somebody on the campus.

What we see as the most likely outcome of the electronic revolution on the campus is that individuals will be able to know what the library has, where it is, perhaps most important, whether it's there or not, and then, to be able to request that information. But the delivery of that information will, in my view, most likely be through conventional forms, at least for the foreseeable future.

I've identified eight issues that I think affect libraries in the context of new technology and copyright. And I'll try to itemize them briefly. These are in no particular order of importance.

The first is the circulation and control of software and other easily reproducible information. Libraries have been and will be acquiring not only books and journals, but software, videotapes, audiotapes, cassettes, perhaps even chips. The traditional role of the library is to make material that it owns available to anybody who is authorized to use that library. The difference, I think, is as people have said, each person is his or her own publisher, and one of the problems I see is the problem of control of duplication once the material gets into the library. We have only limited ability to control what we have. Either we lend the material or we don't. It's as simple as that.

Once we lend the material, what happens to that material once it leaves our premises is totally out of our control. It's probably even out of our control within the premises, as has been seen in the case of coin-operated photocopying machines. But I would suggest that it would be impossible for libraries to control the duplication of material that circulates. And I would suggest that the most advantageous method of addressing this problem is in licensing arangements. That is, the right to purchase should also include the right to duplicate. It seems to me that that's one way of taking the burden off libraries and also recompensing the publisher or creator for some portion of the cost of doing it.

I would say that we're already doing that, although the publishers are probably not admitting it, in the fact that libraries—somebody said earlier, I think, that publishers don't charge libraries more than they charge individuals. For books, that may be true, but they do it for journals. And libraries now pay three or four times the amount of subscription price individuals do. And it might be reasonable to say that the price of subscription might also include the right of copying.

A second problem in the area of electronic journal publishing, questions how to finance library subscriptions in a bimodal arrangement. As long as the items are being published in both print and electronic form, libraries will continue to subscribe to the print form. What happens when someone wants an electronic article quicker than they can get the print article? Who pays? And how much do you charge?

Another problem of electronic publishing as I see it is what do you do with the hard copy output. Now, people have said there will be no hard copy. Well, I can't conceive, for example, of receiving information in electronic form and trying to deliver it to somebody who doesn't have a terminal. So, inevitably, if you subscribe to electronic journals, you'll have to produce some sort of hard copy output. That hard copy output is in itself reproducible, and the problem, for example, of proliferation of a copyright item by the ultimate recipient is not out of the realm of possibility.

It is my view that libraries will deliver the hard copy to the user rather than store the hard copy and create a file of individual articles.

Third, optical and videodisk technology. This seems to me to have tremendous potential for libraries in the area of preservation. I understand yesterday there was a presentation of the Library of Congress Optical Disk Project, of which I am a member of the Advisory Committee. I think you should not underestimate the importance of this technology for preserving deteriorating library collections. We have reached the stage now where we can't even let people look at things that we own, because every time something is handled, it accelerates the deterioration. I think the preservation function of optical videodisk technology will both enable us to hold on to things that we have that are no longer usable, and also to be able to have the public make use of them.

Fourth, the role of the library as a purveyor of information is now being expanded into the role of the library as document deliverer. One of the things I'm concerned about is libraries taking on the commercial role of document delivery. That is, libraries providing photocopies and copies and doing data base searching for individuals not connected with their organizations and not paying the necessary fees and not paying the royalties.

I think as it becomes easier to provide these services, there's a danger that libraries, both public and academic libraries, will not be aware of the legal requirements. There is, as you probably know, a great debate in the library world about fee versus free. By and large, the public libraries stand on the side of everything being free and the academic libraries realizing everything has a charge connected with it.

Now, how does somebody in a public library who's paying taxes, how do they access on-line full text data bases when there's a per unit for the service. Who pays for the copy? Do only people who can afford to pay pay? If the library pays, where does the money come from?

Fifth, telecommunications. One of the major problems in the adaptation of technology is the matter of cost. It is estimated that telecommunications charges will go up 60 percent this year, and that is a large percentage. And I'll give you just one example in the case of the library that I manage. The annual cost would go from $15,000.00 per year to $25,000.00 per year just for the cost of telecommunication with our bibliographic utility.

Again, the question is with all this telecommunication on the campus and in the towns, who's going to pay?

Sixth, the basic economic issue as I see it is that this is a zero sum game. I think there's an expectation on the part of some people that whatever is put out, somebody will buy it. Unfortunately, libraries particularly academic libraries, have only a certain amount of money to spend. And it gets increasingly difficult to get more money from our administrators. If we must spend money for new things, we will not spend money for old things. I think if there are electronic journals being published, then something else will not be acquired. I don't think that there's an infinite supply of money available to us and, therefore, I think that any program, any change, that requires, for example, the payment of royalty fees, the payment of licenses, the payment of additional charges, the cost of doing that will come out of the current budget and that something else will not be done. And if you think that that's going to be personnel costs, I think you're probably deluded.

Seven. I think the university as publisher and other publishers should be concerned about the problem of deposit for copyright purposes of information in nonconventional forms. We publish about 15,000 theses a year. Within the last five years, the number of theses that have been deposited in the library that are not in print form has increased. That is, the entire thesis is now on a videotape. The entire thesis is on an optical disk. No longer in print version. The university will accept that version. What will the Copyright Office accept as a deposit copy?

And, finally, we are concerned about copyright protection for unpublished manuscripts. Most large research libraries are the repositories of manuscripts and archives of their faculty and of other authors and we are increasingly concerned about the rights, both of the library and of the person who deposited the material and the heirs and the estate.

Thank you.

Dr. BEARMAN. Thank you very much, Jay. Our final speaker this morning is Warren Spurlin. Dr. Spurlin is Deputy Superintendent of the Sarasota County Florida public schools and has 26 years of experience in public education, 22 of which were at various levels of administration, ranging from assistant principal in the junior high onto various other positions. He has an earned doctorate, education specialist masters and bachelor of science degrees from Wayne University; Detroit, Michigan; Michigan State University; and the University of Miami. His recent experience includes participation in the MIE National Conference of Producer Educator Perspectives and Educational Software in D.C. And he's authored policy statements to control copyright violation of computer software and mandated staff development in this area for the service of the school district which has drawn national attention.

Before turning the lectern over to Dr. Spurlin, I want to make one correction for the record. Although I had been told by one or two of our speakers that they were representing particular groups, apparently that is not the case. They are here completely as individuals and they are not speaking on behalf of any organization or agency.

Well, Dr. Spurlin.

Dr. SPURLIN. Thank you. My first point is to file a disclaimer. I think the structure of the panel might indicate I would be representing the National School Board Associations' point of view or the AASA point of view. I'll try to do that, but this will really be my interpretation of their point of view. That's what you'll get.

I'm going to try a different tack. To try to condense the impact of what's been talked about in these past few days, and will be talked about tomorrow into ten minutes is irresponsible, so I'm not going to try to do that. I am going to give you a little different dimension about what's happening in public education as a result of the growth in computers, both from the mainframe down now to the micros.

If you'll recall, it wasn't too many years ago that the advent of television just hop-skipped right across education. There were a few lame efforts, sponsored mainly by federal funds, to bring televison into the classroom on a massive basis and it failed miserably. You all remember the planes that flew around over Indiana trying to broadcast in Detroit or Chicago and things like that. By and large, public television was the beginning point—public television broadcasting was really the beginning point of bringing television into the classroom. It did not emanate from the schools or the school people themselves.

The same thing was just about to happen with micro-computers. Micro-computers, in essence, had leapfrogged the school systems into the homes, and it was only through, I think several conincidental things that brought the schools alive in the aspect of using micro-computers for instruction and for management. One (coincidence) was the availability. People just literally dumped mocro-computers on the schools. The academic mind set is not to grab something like a micro-computer, throw it into the classroom and start instructing with it and say it's a good idea. The mind set is to want to file it, to do experiments, to collect data, to review the data, to verify the data, and on and on and on. The public did not allow that to happen.

The legislators, from California to Florida and back and forth, mandated things like computer literacy. And corporations like IBM and some of the others just literally unloaded micro-computers on the schools. There was legislated, and still is legislative activity, to try to get tax breaks and so forth for what we call the Apple Belt.

These things impounded and impacted upon education in such a way micro-computers couldn't be ignored. So we were not necessarily a willing participant in this mushrooming of the micro-computer, the software that goes with it, and its impact. Additionally, it was particularly humbling to edcuators to have it coming off of a game format into the classroom.

So you can see, now you've got a mind set out here that may not be as open as it appears, even as you listen to advocates of micro-computing from within education. And along with that, about a year and a half ago, all these reports began to come out about how poorly public education is doing in many areas, these really created even more excitement in the educational community. This was good for education. So, with that excitement, with that history, it brings us to a point on a Sunday morning at Fort Lauderdale where we're talking about things like copyright violation, the types of protection for authors, a lot of things which frankly educators have paid little or no attention to.

Now, we have taken in Sarasota County and other counties—we're not that unique—we've taken the opportunity to use this copyright issue to work for us. We have a tax spenders mentality, and I think you don't want to use public education as the vanguard for making determinations about copyright issues. Because, very honestly, the issue of whether you try to protect someone's copyright or you spend a few dollars, or you try to get around a copyright when you're spending tax money is different than when it's coming out of the private sector. And I don't mean that in a negative way. It is just different. The easy answer is to pay for things. The better answer might be something else.

And, to try to get a few points across in this brief time, let's not forget that micro-computers are in a way a significant redevelopment of the mainframe computer that's been around forever. The mainframe computer was a very positive and powerful tool for education, just like it was in business, and we used that mainframe computer for classroom-assisted instruction, curriculum-assisted instruction, just like we're using the micro in those ways now.

But the way the software came about was through a licensing process. And the copyright issues for software have really only developed in the educational sphere since the micros have become so available. So maybe we need to look back a little bit into history, at least in the field of education, to take a look at how we licensed the software or the driving ware for those big computers. It worked, and it worked fairly well. And something must have been right because, as you all know, the development was astronomical in terms of time.

I was asked to take a little bit of a look at the future. We do a lot of things right now with the computers: mainframes, micros, and even the resurgence of what we used to call the mini computer which went out of favor. Right now, there are school districts in the United States, which have a computerized relationship between television, computer, with two-way communication capacity. There are mandated programs where there's a low incidence of student participation. There are, in fact, legislatures demanding that you teach something that you don't even have a teacher in your district that can handle. Or if you do, you have only one and you have four schools that must be served. There's no question about the possibility—the strong possibility—of delivering these mandates through networks of television, networks of micro-computers, networks of heavier computers. So that's happening.

We have programs right now—we participate and many others do—where the information about college entrance, about scholarships, about changing requirements, are all computerized and can be accessed daily by the youngsters themselves in counselor's offices. That's a growing thing. Your imagination is your only limit to what kind of networking can do.

Another area is the area of responders. I haven't heard that mentioned. I'm not a technician, so I don't know where that all fits in, but if you could think of a lecture hall like this with all your micro-computers set up in a responder system where the instructor can stand up here, make a point, and ask how many people got that point based on something he'd written down, they punch a button, he knows how successful he's been immediately—that type of instruction is going on. We use it a little bit now in training for our medical people, in adult ed. But that type of technology is tied into computer because the print-out that comes out gives the teacher one hundred percent information on the level of understanding of each student. But that's all right there. It's just a matter of expanding the technology, bringing it into the classroom.

Now this concept of downloading. I hate to use that term because it just wasn't a nice term, somehow. But we have situational requirement set up now. This procedure is a real problem with many copyrights. We buy programs, we bring them in, we put them on what we call a master computer. Out there sits 15 to 20 what we call slave computers. Every 55 minutes, a new youngster comes in, sits down. He has an individualized program programmed into the master computer that's downloaded to that little unit, the slave out there, for that larger micro-computer. Six periods a day we do this, back and forth, back and forth, back and forth. Now, we do this under a licensing agreement. This process is going to be happening more and more.

We (educators) go out and buy our software. We have a policy in our district that we have to negotiate with the vendor before we'll allow anyone to buy software. The buyers have to show evidence—there's a regular process—that they tried to negotiate. At the point that we can't negotiate a copyright release or relief. Or at a point in time when we can't license in a more favorable way, (before we purchase), there is then an administrative review. Sometimes, even if we can't negotiate a deal, we go ahead and buy. If there's no equivalent, and it makes sense, we'll do it.

But this marketplace idea is working very well, and it's the larger companies, quite frankly, that are willing to negotiate with us more often. These kinds of things are happening.

One of our biggest problems, mentioned here, is as educators on a national basis, we subscribe to journals by the hundreds, and we pay heavy fees to subscribe to those journals. And then the journals come out with articles that are germane to something we're doing and have widespread application and we feel we have a right to make some reasonable copies and distribute those to various staff. We're having a battle. We're having a battle with the School Board Association over the School Board Journal with the administrative group over their magazine. So there's got to be some new concepts in licensing arrangements if in fact the school districts are not going to be forced to become dishonest.

My last point. It was said several times today, and let me say that I just don't see any other way around it. We're talking about something called education. And in our school district's policy on copyright, we require every teacher and every student to go through a program that we call computer literacy. A big component of computer literacy for the teacher group is the understanding of the copyright laws and the ramification of those laws as they are applied to education. A large component for our youngsters in computer literacy is an understanding of the law around computers. What it all means, the software, the hardware, their values, their relationship. And if we get to the point where we have a computer in every home, as we now have a tv set in every home and we get the schools working with software that can be interchanged, a sort of library for classroom, home and community use then you've got a hell of a relationship between home and school that we never could have had otherwise. That relationship is going to develop. As this relationship grows we're going to have a gap if we're not careful, because every home isn't going to immediately have a computer terminal, and every home isn't going to have a tv set. So if you begin to design your instruction based on that mode, then somewhere we got to provide for filling the gaps between the micro-computer haves and the have-nots.

I'm sure I've distorted everything and I appreciate your time. Thank you.

[Applause.]

Dr. **Bearman**. Thank you very much. Well, we have heard five excellent presentations from producers, distributors, and users, in looking at both private sector and public sector concerns. We would like to take questions first from the members of Congress, our primary audience, if you have any of those. Any member of Congress wish to ask a question?

Mr. **Conyers**. Yes, John Conyers here. I would like to ask Mr. Spurlin whether he considers the use of computers the wave of the future in public education. All of us in the Congress have been deeply involved in educational issues. In some communities, it appears that there is pressure put on, sometimes by parents and sometimes by people that think it's the way to go and they're disturbed that their school system isn't doing it, there is that gap that is being discussed between those poor communities where there is no preliminary effort, and then there's always, as you mentioned briefly, the game syndrome and what that might do to a youngster. I was just thinking that many of them hang out in arcades, but when they come to using a computer in school this may seem something that they may not want to indulge in. So I would like to get your feel for where this thing is going in education.

Dr. **Spurlin**. Very quickly, if I could go in reverse order. We're hoping that the game syndrome will be reversed. We know that the game syndrome brought it on, but we feel strongly the computer is a powerful enough instruction device, it'll overcome that.

Now, jumping to your first question. There's no question that the micro-computer is the trend right now. It's really too early for me to have a personal feeling about its value as opposed, let's say, to a teacher in the classroom or to a textbook that the youngster can take home. But the data has turned around. The data from 1960 through '68 did not indicate that computer-assisted instruction made significant differences in learning. The most recent data, using the different programs, the better software—I didn't even begin to know how poor the software has been up to the last few years—so anyway, my point is I think it's turning around. I think you have evidence now that computer-assisted instruction is as good or better than traditional instruction.

I think it's something we have to watch now. I think it's going to be a powerful, powerful tool in the classroom.

Dr. **Bearman**. I'd like to add one short comment to that. Having worked in all of the areas you've heard about this morning, the concern that I have is that we harness the technology to do what we want it to do. It bothers me to think of an author who must sit in front of a terminal who would prefer to take his yellow pad outside on the hammock or something. In many cases, we are restricted by technology. I think we should go back to the original Greek root of the word, "techne", which is a systematic interweaving of arts and crafts. It says nothing about hardware. And we must make sure that we're in control of that technology, and not let it come in and tell us what to do. I think we're hearing a little of that where the computers have come into the school and nobody had set the goals that they wanted to use these computers for.

Another question? Yes, sir.

Response From Audience. I'm wondering about the equity for consumers in all of this. You have a certain group of captive consumers who are going to pay, can't get away from paying. Now we're talking about promiscuous copying which will provide another class of consumers who will not pay anything. What will be the effect on captive consumers? Will the costs be uploaded on them? [Laughter.]

Dr. **Bearman**. Would any panelist like to take a stab at answering that one?

Ms. **Hunter**. I think—I hope not. Certainly, that's what has happened in our area. I don't know what publisher who publishes journals who can say and defend the fact that photocopying has in fact resulted in significantly fewer subscriptions, but we certainly feel that it's a contribution to it, and the end result has been those who continue to buy it pay a higher price, yes.

Now, what I hope is, and as I said, in the future, we should have more flexibility in how we sell and I hope that we can develop pricing mechanisms and market mechanisms that mean all users pay a lower, but fairer price.

Dr. BEARMAN. One of the questions that has been raised to the library community is about the non-captive consumers. What about the widening gap between the information rich and the information poor? Those who can't get access to material in electronic form only. And I think that an important question to keep in mind here also, is the need to distinguish among costs and price and value. We can determine what a product cost and maybe that cost will go up. We can determine what the value is to society which is one of the major concerns before Congress at all times, what is in the interest of society to do. The pricing can be handled in many ways, either passed on directly to consumers, subsidized for certain groups, et cetera.

I think often those three get confused and it's essential to keep them separate from one another.

Other questions? Yes.

RESPONSE FROM AUDIENCE. Well, if the consumer's going to pay a lower fair price and we have all this pirating that's going on and there's no real protection for the author and for the people that produce the materials, is there going to be the incentive, let's say, to put out a quality product to begin with?

Ms. HUNTER. I don't know for sure. I can only give you an example. I hope so; otherwise, well, I don't know. Yes, I think so.

We're considering right now a package in the scientific area that every group of scientists we talk with in the market test about, absolutely agrees that it will be a dramatic improvement over what's available now. It is not clear to us now that we can afford to put it together, or that the amount of non-compensated use—that we can structure it in such a way that the amount of non-compensated use will cover cost of building it. I don't know. I don't have a good answer for that.

Dr. BEARMAN. Jay, you wanted to add something?

Dr. LUCKER. Motivation for publishing scientific, scholarly, technical information, is not financial. First of all, the rewards as Judge Breyer said, are different. Secondly, rather than receiving payment for publishing, in many cases you have to pay to be published. Page charges, for example, are still a way of life in many scientific and technical areas.

In addition to which, the cost of doing the research, in many cases, is borne by the United States government. A great deal of basic research and the applied research in this country is funded by the United States government, and, therefore, the output, the publication is in a sense being subsidized. In fact, I've always found it somewhat ironic that in this area of sponsored research where the cost of doing the research is paid for by the taxpayer, and the fruits of the research are being disseminated by the publisher, a lot of the taxpayers are paying a second time to get that information.

I don't think that at least in the area of scientific and scholarly publishing that it will inhibit output.

Dr. BEARMAN. Yes, sir?

Mr. FISH. Ham Fish from New York. Mr. Lash, yesterday you saw a slide that, as I recall the figures roughly, the author got about 5 percent, the publisher 35 to 40, and the distributor, the second largest share of the profits. Your message to us was don't forget the author. I wonder if you care to elaborate as to what we should have in mind so as not to forget the author.

Mr. LASH. Well, I was thinking, Congressman Fish, basically of the terms of the electronic publishing project that if there are savings to the publisher as a result of our coding these manuscripts that part of the savings be passed on to the author and not just held by the publisher.

I do think that this is not a—it can't be answered by general principles. Anyone who's read the history of the struggles in the code authorities as to whether the consumer is going to be forgotten as between the determination of the administration to raise prices and the trade unions to raise prices so they can get higher wages, and the industries will remember that the consumers had a chance, only because they were well organized and represented by Mary Harriman Rumsey, and when she died, then the consumer thing fell apart, the consumers were forgotten.

Now, I think it's in part a challenge to the Authors Guild that there is this onrushing technology that we have to be aware of, we have to be represented at meetings such as this and other comparable meetings in Congress, Congressional committees, so that we are not forgotten.

But I don't have any particular formula for the purpose.

Ms. Hunter. I'd like to make one other comment that if the slide that you referred to yesterday morning—I was not here for that, so I regret that I can't respond except the figures you quote don't make sense for the kind of publishing that we have done. I have worked out if you took a typical $40.00 professional book, if that was the list price, indeed the largest section of that, perhaps 25 percent, would go to the next step in the sales chain, so that's your wholesaler or your book store or somewhere in that range. About 20 percent for physical paper production and binding, printing; 15 percent for other marketing costs; 5 to 10 percent for your editorial R&D kind of development, your cost of handling and thinking about acquiring the material; 10 to 15 percent for general overhead. In other words, 80 percent approximately are direct cost items. That leaves you with something that gets between the author and the publisher, and typically, it is 60 percent author, let's say 40 percent publisher. That's maybe 12 percent to the author, 8 percent to the publishers. So the 35 percent figure, I'm not quite sure who's getting that. It's not most publishers.

Response From Audience. All right. I believe I could clarify that. That was actually software publishing that was being quoted yesterday. It turned out not to be totally inconsonant with book publishing, but . . . .

Dr. Bearman. Thank you. Congressman Smith?

Mr. Smith. I'm curious about after having heard some of the panelists give their competing philosophies, and they are in fact—I'm curious as to whether anyone would hazard a guess on these issues. The first issue is whether or not we can write a comprehensive law which would in fact be sufficiently broad, yet sufficiently specific, to be protective of the area we're trying to protect; and secondarily, if that's not the case, would we then have to break down copyrights like we have never done before into specific areas of knowledge or information, or use, and literally deal with the subject on different levels for the different dissemination modes.

Dr. Bearman. Who's the brave panelist to start this response?

Mr. Breyer. Those are the questions that I wanted to raise. The issue is: will the "material" be produced. The kind of protection not appropriate for Walt Whitman, or a "trade book" author, could be totally different from the kind of protection that in proper is some other area. Can you separate, or distinguish the areas in question, one from another?

The way I'd go about breaking them down is to get Professor Lucker and a list of economic factors in favor of, or against, protection. I'd see if it's possible, for congressional staff to go through each of the products asking for protection, area by area, and develop tentative ideas about where the case for protection is strongest. If we do not know, we can refuse to provide protection—we can wait and see if a big production problem develops—and then, if it does, we can reconsider our earlier decision.

Mr. Smith. Well, assuming it would be possible to break it out, how would you get around equal protection?

Mr. Breyer. The reason one would distinguish among products or areas is to see if in say Area X, the need for the protection to obtain production is greater than elsewhere or the risks that the protection will interfere with dissemination of material might be unusually small. Such reasons are sufficient to justify different legislative treatment and to avoid any equal protection problem.

Mr. Smith. Thank you.

Dr. Bearman. Jay or anyone else, would you like to comment on that? I guess we're all hesitant because we're not lawyers. The question is whether a single piece of legislation can cover it.

My hesitancy in looking toward one piece of legislation is that so much of what we've been hearing about and from what I know from data base producers, must be protected by licenses and leasing arrangements. The other problem I see is that we have so many different segments of society. I think that what Dr. Spurlin was saying is we cannot treat the users all the same way. We cannot treat the types of information all the same way. Knowledge and information are indeed very different.

So I guess my response is a tentative no to the first part, and I think it's going to take a rather large coalition to come up with alternatives to do that.

Yes, Dr. Boorstin?

Dr. Boorstin I would like to add a word or comment on what Judge Breyer said and what Congressman Smith said. Judge Breyer was observing on the need for restrictions to bring about the production of the product, the imaginative product. I would like to suggest that that might be a usable principle in the case of the less important, the less revolutionary, the less basic artistic creations. But if we look at the history of the great works, imaginative works in literature, I think that the one thing we can say about them is that their production was unpredictable. Perhaps if we would produce a tyrannic, tzarist society, we might produce some Tolstoys and Dostoeyvskis. That wouldn't be worth the price.

And what I suggest is that what we really are concerned with here is to create a society, an atmosphere, and this goes back to something that Devine mentioned this morning, create a society in which we will encourage the unpredictable; that is, encourage productivity for reasons we can't quite understand which means then that what we're doing with compensation is not to provide an incentive to the great creative artist, but rather, we're creating an atmosphere of freedom and spontaneity and rewards for creativity, and the rewards for that compensation go to the whole community because the community which values creativity and which has the satisfaction of rewarding its artists is a richer, more productive community than one which measures the compensation in a more purely economic way.

Mr. Breyer. One idea that's always intrigued me is the moral right of the author. European countries have specifically given such protection. We have not. Should we do so?

Dr. Boorstin. Society profits when the community rewards those people who produce creative work even though they didn't produce the creative work for economic reasons.

Panelist. I might say in support of your position, Dr. Boorstin, that the Institute of Advanced Study that was set up primarily to house Einstein, was not based on the copyright principle except that it was to create an atmosphere in which the mind like Einstein's could work congenially. And the most important part of it may have been that they should be peers so that there was an intellectual test and creative test for the other kinds of people that were brought in.

Now, I wouldn't, for a moment, seem to disparage that incentive as part of it, but I do think it is fundamentally based on the copyright system as it exists in the country and that if we throw that out, we may be throwing out a lot more.

Dr. Bearman. I think we also have the question of what is it that we're protecting. If it is an idea, that's one thing. Are we talking about not protecting electrical impulses. So the technology that we originally set copyright up to deal with was developed in the fifteenth century, and now we're dealing with quite different technology.

Yes, sir, one last question. I understand we have to close at 12:15, so, please.

Mr. Kernochan. Yes, John Kernochan, Columbia. I found Judge Breyer's presentation very stimulating and I agree with him that differentiation between kinds of copyrighted material is absolutely vital. I sympathise with him, in having reread his article. I think that it might also have been useful if he had read further in Macaulay who he cited in support, and I'd just like to read for a moment what Macaulay did say in 1856. It's still relevant to copyright revision.

He says, "The advantages arising from a system of copyright are obvious. It is desirable we should have a supply of good books. We cannot have such a supply unless writers are liberally remunerated, and the least objectionable way of remunerating them is by means of copyright. You cannot depend for literary instruction on the leisured men occupied in the pursuits of active life. You must not look to such deep meditation and long research. It is then on men whose profession is literature and whose private means are not ample that you must rely for a supply of valuable books. Such men must be remunerated for their labor and there are only two ways in which they can be remunerated. One of those ways is patronage, the other is copyright. I can conceive of no system more favorable to the integrity and independence of liberated man than one under which they should be taught not to look for their daily bread to the favor of ministers. We must betake ourselves to copyright in spite of the inconveniences of copyright."

Mr. Breyer. I agree with it. But also remember the most famous Macaulay statement of all, when asked to support a reform bill, he said "Reform? Reform? Don't talk to me about reform. We're in enough trouble already." [Laughter.]

Dr. Bearman. Well, with that wonderful demonstration of information retrieval [Laughter.] thank you, sir.

May I thank you all very much, and please join me in thanking our excellent panelists.

[Applause.]

MASS MEDIA DISTRIBUTION: THE FUTURE

Mr. Goldstein. We're ready to begin this afternoon's program. This morning, we heard about information processing and also the importance of technology in terms of new questions concerning education, library and publishing. This afternoon, we're going to begin more in the vein of the entertainment industry in a sense, concerned with the distribution of programming, either films, broadcast programming, sports programming, and the like, and the questions that are going to be raised in these areas as we move on towards the 21st century.

We have an excellent panel and an excellent moderator. Our moderator today is Professor Harvey Zuckman, who teaches at Catholic University Law School, the Columbus School of Law in Washington. He also serves as the Director of the Law School's Communications Law Institute and, in addition, he is a part of the Montgomery County Cable Advisory Committee, Montgomery County being in the State of Maryland.

And, without further ado, I'd like to turn it over to Harvey.

Mr. ZUCKMAN. Good afternoon, and welcome to Panel Number 3, which is Mass Media Distribution, The Future. Or, it might be entitle "What Has Modern Technology Wrought to our Audio and Video Terminals?" Because of rather severe time constraints and the desire to have plenty of time for cross-discussion and questions from the audience, introductions of our distinguished panel will be brief. This is an extremely fine panel of experts.

Before I begin, however, normally I don't tell stories in opening programs and that because one, either I can't think of an appropriate story, or two, I mess up the punchline. But I want to share with you a story that, as God is my witness, is true.

Last night, in walking down the corridor toward the reception, I happened to notice four waiters in their waiters' tuxedos outside the ballroom where I believe the Jewish Federation of Greater Fort Lauderdale was having its dinner dance. And much to my amazement, I heard one waiter say to the other, with some passion, "No, you're wrong. The copyright stays with the author!" [Laughter.]

And the other one says, "No, it can't be. It belongs to the publisher!" [Laughter.]

And, you know, I was just sort of dumbstruck by this and I guess because of that, I didn't intervene in any way and I went down to the reception and told a few of you this story. Later that evening, I called home to find out everything was and I shared the story with my wife and I thought she would just laugh and be amused. She said, "Why didn't you intervene? Why didn't you go in there and answer their question?" And I said, "Well, one reason is I'm not sure that I would have known what to say until I've heard all the panels today." [Laughter.]

And so, if those four waiters are out in this audience somewhere [Laughter.] let me just say that after this panel, I would be very happy to discuss the situation with you. [Laughter.]

The panelists, and I will just list them briefly now, and then introduce them at a little more length as they come up to speak, are to my immediate left, Bryan L. Burns, who is Director of Broadcasting for the Office of the Commissioner of Baseball; Mel Harris, President of Paramount Video; Gus M. Hauser, Chairman and Chief Executive Officer of Hauser Communications; William Lilley, III, who is the Vice President of Corporate Affairs for CBS, Incorporated; and Clyde Washburn, who is Chief Scientist for Earth Terminals, Incorporated.

The topic for this panel, again, is Mass Distribution: The Future. More specifically, the panelists are called upon to discuss the impact of the new and future systems of mass distribution of news, information, and entertainment upon the traditional rights of the creators or owners of intellectual property. Perhaps the model for copyright protection that began sometime after the development of the printing press no longer serves the needs of either the property owner or the public, generally, in this post-industrial technological age. That, of course, is not for any one particular person to say, though I think the collective judgment ultimately will have to be made.

But if this is so, what are the Congress and the courts to do in the long run to mediate conflicting interests? Before I pose the first specific question to get things moving, I just want to again admonish the panel that we're going to try and stay on time as best we can, and to limit your remarks to five to seven minutes.

The one general question that I would pose at this time, and you may have others during the cross-discussion, is what will your industry look like, technologically, in five or ten years, and what intellectual property issues do you foresee.

Now, our first speaker is Bryan L. Burns. He is Director of Broadcasting in the Office of the Commissioner of Baseball, and I would venture to say there must be at least 10,000 people out there that would love to have Bryan's job. And almost all of them have contacted him about that.

Prior to joining the Commissioner's Office, he worked with the Kansas City Royals in public relations and as Director of Marketing and Special Events. He holds a bachelor of science degree in communications.

Mr. Burns.

Mr. **Burns**. Ladies and gentlemen, good day. I was at the pool yesterday, reading this magazine. I would think most of you are familiar with it. It's called "Channels." It's a bi-monthly publication that provides some in-depth, interesting reading about the communications industry. I ran into an ad inside, advertising the publication itself. It has a little tear-out card for you to send in and subscribe. And it lists various topics that the magazine covers, including public television, computers, music videos, and, among others, video sports.

In the little video sports subsection up here in the corner, it says in part, "What does it say about society when a club owner refers to his team as 'software'?" [Laughter.]

Well, what does that say? Let's talk about that. It quite simply says this hypothetical team owner who's made a financial investment, a creative investment, an organizational investment, and among other things, a management investment should have the right to be offered a measure of protection against another party's desire to take the final product of that work and re-offer it in the marketplace.

What makes this statement that refers to a club owner's view of himself as software so emotional? What makes it valuable to be used to sell this publication? Why is that supposed to work? Why is it supposed to motivate me to take this card, cut it out, and send it in?

It's the terminology. And the terminology is a function of the technology. The technology of mass media distribution in the future, and that's why we're here. My seeing that yesterday was, to say the least, quite timely.

What we are dealing with here is incredibly simple and yet everyday these topics seem to become increasingly complex. The complexity comes from the technology which we can use to better facilitate the distribution of our products. However, the technology, at the same time, opens the door for others to take advantage of the works our efforts create.

I've noted with interest the concern voiced by the movie folks who are engaged in the satellite distribution of HBO, Showtime, Movie Channel, Cinemax, and so on. Some say the effectiveness of satellite distribution outweighs the downside of piracy. I guess we in sports are somewhat in the same boat, because we use the technology, too. However, we really have a hard time understanding why there has to be any downside at all. It is obvious, however, there is no simple solution to that problem. We in sports have been very alert to the new technologies. In baseball, we're very deeply into it, taking advantage of it. We're striving for the most efficient variety of choices, choices which include national network television, local conventional television, and local or regional pay television.

Amidst all the concern about sports franchises taking games away from conventional television, we continue to advise our clubs in baseball that it is not in their best interests to do so, and all the clubs agree. They are in total agreement. Continued use of conventional television is exceptionally important to the marketing of our game.

We do, however, have at least seven clubs who in 1984 will start a local or regional pay television operation. I think you'll find it interesting that industry-wide baseball will add over 500 telecasts this year and lose less than 10 percent of that number of conventional television. Our new six-year contracts with NBC and ABC set the stages for the display of more games than ever before on national, local and regional free and pay television. Our bottom line in '84, and the sort of medium range future, is that we will see little change in the number of games available to the public and we will continue to rely very heavily on conventional television as a vitally important part of the marketing mix.

During this period, I think you will see most of our franchises find ways to utilize *all* of their games. I guess I should say all of the software they were not using in the past. we strongly believe that the consumer, in the end, will be better served than he is today.

But what heppens when new technology comes along and captures product for distribution without the owner's control? The starting point for any such discussion should be that an author or producer's work is recognized as his and should not be controlled or distributed by outsiders. Unfortunately the regulatory system has distorted that reality.

Our current recourse is rather sloppy, rather abrasive. To call attention to the piracy situation, we usually have to get involved with the consumer and enforce the ownership rights of an author or a producer. It's somewhat like allowing a locksmith to sit outside the bank and sell keys to the vault and then, when somebody comes outside with the money, we turn to the Congress and the Copyright Royalty Tribunal to assess value to be received for the use of the money—value from those individuals who purchased keys—not the locksmith.

As we head to the future and all of the complex choices and opportunities that technology will bring to us, there is a need to revise these rules which allow the proprietary rights of program producers to be circumvented.

This is a kind of crystal ball weekend for you, to look ahead to the future and visualize what opportunities will be available to us by the end of this decade and on into the next one.

As regards the sports product, I think we are in a period of transition with regard to the shaping of the sports business by technology. Does hardware drive us to pay-per-view? Or will the programming opportunities that are available drive the local operators and MSO's to step forward and take the capital intensive step to addressability? Our baseball clubs' actions, I think, have spoken for themselves. We're not going to wait for the wheel to be invented. We have 20 of our 26 clubs in pay television in '84. All but one are involved with a local or regional sports channel of sorts that combines various programming for a monthly fee, not unlike the movie channels which you're all familiar with.

Most of the contractual arrangements in pay television call for four, five, or more years duration. Past that, it would appear that the consumer's choice will be even greater. Built on the top of the base of local and national conventional television will be a virtual plethora of choices for the viewer: monthly, by event, by sport, by day of the week, with potentially a lesser cost for viewing on a delayed basis. The list of possibilities goes on and on, and the list will be regulated by the available technology.

The focus for today's corrective look to the future should thus be somewhat simple. For marketplace to work and allow the choices that will be available to the consumer down this technological road, there is a need to build upon a base of protection for the program producers. It is not only financial and creative interest that will be at stake, but really also the marketing decisions that are made as additional products are taken to the marketplace.

If you'll recall our banker from a few moments ago, his decisions as to what financial products to offer to the consumer in the marketplace will be a lot more realistic if he knows the locksmith won't be at the door with a sign that says, "Buy your keys here." We really are no different. The sports interests will only be able to realistically decide how to go to the marketplace if we have reasonable assurance that we can control our product without others having the right to take our products and compete in the marketplace . . . and compete without incurring the upfront costs we will continue to face.

In short, let's stop the locksmith by now considering measures that will deter him from going to the bank's front door.

In behalf of all the sports' interests, we thank you for the opportunity to be here, be on the panel, to interact with you, and to help you analyze your thoughts on the distribution of our software in the future.

Thank you very much.

Mr. ZUCKMAN. Bryan, can I ask you just one question. What is MSO? You referred to that.

Mr. BURNS. MSO stands for Multiple System Operator, which is normally a company that owns a number of cable systems, either regionally or throughout the country.

Mr. ZUCKMAN. Thank you. Let me just suggest that the panelists will try to avoid the alphabet soup of mass communications. There are some of us who don't recognize all the letters.

Our next speaker is Mel Harris, who is President of Paramount Video. Mr. Harris has worldwide responsibility for the programming, production, and distribution of pay television from video and supplemental markets. He holds positions on the Board of Directors of several major corporations, including USA Cable Network, CIC Video—that deals with international programming—and the United Press International Pay Television, which is based in London.

He came to Paramount in 1977, and before that was engaged in commercial broadcasting. He holds three degrees in mass communications, including a Ph. D.

Mr. Harris?

Mr. HARRIS. Thank you. One correction. That's United International Pictures Television. They all are international pay television organizations.

Let me first say that Mr. Spock, John Travolta, and Jennifer Beals are not data bases. [Laughter.]

So we start from somewhat a different point of view in terms of copyright. It has been a concern for motion picture producers and television producers for a long time before data bases were invented as a phrase.

Copyright has never been more important than now, we feel, and the public has a great interest in it because as we move from an industrial society into an information society, more and more people are going to have their jobs dependent on copyrighted material. And when a person's job is at stake, they get very interested. So we think copyright is very important at a very prime and basic public level.

The impact of the new technologies, on my industry, and therefore, the impact on copyright, has been very immediate and very far-reaching. My job didn't exist four years ago. We had a time when motion pictures went from the theater to network television to syndication, and that was it. In the past four years, we have inserted in between there, home video, pay per view, subecription pay television, and, in many cases, those now are larger revenue markets than some of the older ones were.

The price for that has been a reduction in revenue coming in from some of the old markets, such as network television, which no longer consumes motion picture product in the same way it did in the past.

Our sequence right now is theatrical, non-theatrical, which includes such things as the exhibition which takes place here in this hotel this evening, where you'll see them exhibited for public performance and I trust those are licensed performances. [Laughter.]

Home video, which comes before any of the exhibition modes of electronics, because if you don't do it first it gets copied off the air and pirated and the home video market creates itself. That's videocassettes and videodisks. Per per view follows very closely. Subscription pay television follows about six months to a year later. It then goes to network television, then back to subscription pay television, because of its enormous appetite for product, and then into syndication, probably back to pay television once again, because many, many motion pictures are needed to keep 24 hour services occupied.

That's the impact, simply in the direction of our distribution.

The recoupment of investment for video products, film or tape today, requires that all those markets be there also. This is not newfound money. Costs are up, primarily because one, labor. We have a lot of organized labor organizations that get increases and it takes a lot of people to make a movie, and it's still somewhat an alchemy. You don't know when you start whether the cake's going to be good when it comes out of the oven or not.

One of the other primary reasons for increases in cost is the fact that it's so much harder to get people's attention today, because of the proliferation of media. It's hard to get their attention, hard to market. So marketing costs have gone up extraordinarily, just to get the people's attention to come see a motion picture.

So it is very important that we have the ability to recoup our investment from each of these markets, old and new.

Key future issues that I would like to focus on just for a moment. One is I think we have to be very careful that whatever fair use is today does not move over into an area of public performance. And this hotel, I think, is a perfect example of what I'm describing. If you walk by the disco, you see a big ad there for big screen television: come in and watch the videos. On your little social calendar, it says you can watch Victor, Victoria in the movie room. Well, those are very close together and it's a very easy move to say "Why are we licensing those movies to be shown our guests, when we could just run them on that videotape player there on the disco and play them back there?"

I don't think anybody questions that there is a difference between private consumption and public performance, but it gets real shady these days when you look at bars, hotels, restaurants, so-called preview rooms, that are really public performance and copyrighted material must be compensated for that exhibition.

Secondly, I would focus on the international copyright problem. Film and tape are one of the most valuable export products, I think that we have in this country. We have a very favorable balance of trade with that product. And when we start looking down the future with the satellite signal stealing, the home video pirates, and the public performance abuses that take place internationally, that very valuable balance of trade could easily be thwarted, because we don't receive the compensation back from it.

And as my final point, I would stress again and as I listened—I wasn't here yesterday, but today, to the discussions of computer software and libraries, all of which are very, very important issues. It is easy to get caught up in the jargon and in the software and in the gadgets—software nomenclature and gadgets. But the point is intellectual property is property and is subject to the same abuses as any other form of property. Some of the exchanges made this morning made me want to restate this again.

Theft is morally wrong, whether or not you can prove that you had a specific damage at the time that the property was stolen from you.

And severe punishment, or the threat of severe punishment, makes administration or policy of those kinds of laws fairly easy. When we finally got a good piracy law in this country, with the President signing it, it helped a great deal. People police themselves when they know there's a real threat.

And piracy, more properly, stealing, as was pointed out this morning, does do economic harm. It's hard to demonstrate many times because piracy occurs on the best products, not on the worst product. They don't want to pirate my bad movies. They want to pirate my good movies. And the good movies are usually in profit, so it's easy to point and say, "Well, you've already made your money somewhere else. What difference does that little bit that's being pirated off there matter?"

Well, the fact is that the profitable products are what subsidize the unprofitable products, and any time the thief can steal any of the profits, it reduces the ability of the creator to keept on creating. It's like a story I've heard of a gentleman driving down a country road and sees a pig with a wooden leg hobbling in the farmer's field. And he stops to ask farmer the question, he says, "Why does this pig have a wooden leg? The farmer said, "Oh, that's my favorite pig. He's a wonderful pig. Last winter, he saved my wife and myself from a fire. He came in and woke us up." He said, "Okay, but what about the wooden leg?" He said, "Well, he's really a wonderful pig. My tractor turned over me last spring and I was trapped underneath it and the pig came and dug me out and I was saved. I really love that pig.

Once again, he asked, "Well, what about the wooden leg?" He said, "Well, gee, if you had a wonderful pig like that, would you eat him all at once?" [Laughter.]

And the point is that I don't want to be looked upon as a pig. [Laughter.]

But if we get eaten a little bit at a time, it does make it a lot harder for us to run. Thank you.

Mr. ZUCKMAN. Our next speaker is Gustave Hauser. He is Chairman of Hauser Communications, an investment and operating company in cable television and other—and engaged in other electronic communications operations. He is Vice Chairman and will be the next Chairman of the National Cable Television Association. For ten years, he was chairman of Warner Am Cable Communications, and is a founder of Orion Satellite Corporation, in which he is also an investor and director.

Mr. Hauser.

Mr. HAUSER. Thank you very much. In the relatively few minutes which we have available here, I would like to address myself to some perspectives on cable and satellites which, in tandem, constitute the major new development in the distribution of information or intellectual property. These distribution techniques along with telephone lines, are involved in all of the issues which were raised here yesterday and today, as we leave the traditional, physical embodiments of intellectual property, such as print and movies, and move to electronics versions of intellectual property, some of which are totally new.

Through cable and satellites we are capable of delivering information electronically to an ever-changing universe of new terminal devices. These terminal devices enable the recipient to store, and/or manipulate what he has received electronically. The problem is one of the control of the receipt and the usage of this information by individuals who have terminals that are really not passive. The TV set was passive. But terminals currently in use are truly active, with features which permit information to be delivered for a limited purpose or time to a particular recipient. At issue is the way in which this limited purpose can be policed or enforced.

I thought I'd take a track at the word "downloading," which has been so frequently discussed at this conference. Downloading is a word recently created to describe some old things and some new things. It is the electronic delivery of information to an intended recipient for an intended purpose (which may, of course, be perverted).

It is an alternative to the traditional method of delivering intellectual property in a physical form, such as a book. We may now send it through a wire or over the air. Broadcasting is the downloading, electronically, of programs intended for everybody. But it is possible to be more selective. Cable and satellites are continuously downloading material, including movies, computer software, or games, which people may use and manipulate in their home. And we're sending this material not to the public in general but to paying customers in particular, and for a limited purpose.

The law has sought to promote the widespread dissemination of information while protecting the copyright owners' right to obtain compensation. But the practical basis for accomplishing these goals has shifted with technological developments in our industry, and we are suffering greatly from signal theft and, of course, from the copying of program material.

I suggest that particular attention be given to signal theft, particularly, because our industry is attempting to obtain legislation at the local level making this a crime. We are trying to make the public aware that it is a serious problem, that they are taking somebody's property. The number of people stealing signals from cable and satellites is vast, and amongst the general public, in our culture, it is not regarded as a serious misdemeanor, or any kind of crime at all.

However, I believe that what is today a problem of policing rights may actually be resolved at some future time by further technological developments. Senator Mathias has said that our ability to maintain the principle of copyright may be in question. I don't really believe that we're facing such a cataclysmic question. We're at an interim step in technology; one that still permits thievery and copying and we're evolving to something else, if we can only wait for it. What we have done in the meantime is actually quite ingenious, in my opinion. We have managed to provide compensation and to permit the public to have access to material which they deserve to have.

At a certain technological level of mass media distribution, the issuance of compulsory and blanket licenses appeared to be a way to strike a balance between the constitutional mandate to encourage the widespread dissemination of information and the right of copyright holders to be paid.

These licenses have been widely used, where it is possible to control the disseminator or, what was called last night, the bottleneck. Payment is obtained from the person or company distributing the information, such as a cable operator. But the problem has shifted to the home, and we cannot adequately police any blanket license or privileged use for which a payment is to be received, because we cannot control or limit what goes on in the home.

Consideration is, therefore, being given to a tax on the sale of terminals or equipment that make copying or theft possible. A tax on the VCR or a tax on tape. But as the technology develops, I think these alternatives will be supplemented by other options which will permit a very reliable segmentation of uses and the collection of money on an individual basis. We are already evolving from an era based on the technology of mass distribution to a progressive ability to segment and to monitor individual uses of programming. And we will then have the ability to distinguish between types of use, quantity of use, the amount of time, and to differentiate fees on the basis of the quality of the program.

Already, we've seen such developments in the telephone business, where computers permit phone calls to be charged to individual users, and in offices, even Xerox machine usage may be monitored and charged to an individual client. Similar developments are occurring in cable and satellite distributions.

Cable at first obtained a license to retransmit off-air television signals intended for the public. This, in effect was a compulsory license. At the same time cable accepted a duty to carry local and network (the must-carry rules).

When cable began carrying "distant" TV signals, a compulsory copyright license was issued and a fee charged to cable operators, the level of which was to be periodically reviewed by a copyright tribunal. This assured the widespread availability of programs to the public. However, this purpose has been constantly threatened, or even thwarted, by the rulings of the Copyright Tribunal making distant signal carriage prohibitively expensive.

With the advent of subscription pay television in the late 70s, cable began installing additional technology to secure individual channels of programming and to limit the availability of "pay" programming to specific subscribers. Then cable offered pay per view services and something which is very important, called addressability. Widespread addressability is now being installed in the cable industry. This provides a capability to address specific programs, whether audio or visual, to specific intended users and to secure it at the subscriber's premises. Addressable pay per view services represent very great horizons for the cable industry, and the technology is also useful for direct broadcast satellites, and other delivery systems.

In short, we are evolving into a very much more sophisticated era driven by technology, cultural acceptance and marketing in which a la carte and on-demand programming, rather than mass media distribution, will be widely available.

The problem of copying, even by intended users of information, will probably get worse before it gets better. But we are clearly on a technological track which will permit us to secure information however presented. Patience is required, and I believe that any hasty legislative solutions which freeze the status quo or attempt to anticipate technological developments are dangerous and threaten to strangle the technological ferment and developments which have caused us to be here today.

Thank you.

Mr. **Zuckman**. The next speaker is William Lilley, III. He is Vice President for Corporate Affairs of CBS, Incorporated and is the co-author of *New Technologies Affecting Broadcasting*. Before coming to CBS, he worked as a vice president for governmental affairs for the American Express Company, and before that, he served in several high level positions with the federal government, including minority staff director for the House Committee on the Budget, Director of the Council on Wage and Price Stability, and Deputy Assistant Secretary of then Housing and Urban Development.

In an earlier period, he was a professor of government at the University of Virginia and an assistant professor of history at Yale.

Mr. Lilley.

Mr. **Lilley**. Thank you. Glad to be here and I've worked in different government jobs and I cannot remember two committees of Congress being so serious about an issue that they went on a retreat and shut the doors and took a look at it. Maybe it's happened; I just didn't know about it.

What I thought I would do, maybe it's the only thing I know how to do, but what I thought might be helpful would be to try to tell you how at CBS, from a business planning point of view, looking forward to what investments we ought to be making and what investments we ought to be getting out of, and what investments we think our competitors will get into and out of in the future, that I might approach the relevant copyright problems from that point and tell you how he have tried to make our investment decisions regarding your problems.

I'd like to first talk about the big change that has occurred in all the businesses sitting at this table. CBS is probably more emblematic of them than most companies; CBS is the biggest broadcaster in the country, we're the biggest recorded music creator and distributor, the fifth biggest publisher in the country and the fifth biggest manufacturer of toys and games. We've started a major motion picture studio with Time, Inc. and Columbia and we have the largest home video company, CBS-Fox Home Video. In terms of market share, CBS-Fox is just ahead of Mel Harris' Paramount Home Video. So we are in all of the markets that are being discussed today.

If you look at these businesses, the change that has swept these businesses is really only about eight years of standing and I just can't resist telling you the degree of change. If you look back on all of those businesses, less than ten years ago they were characterized by four things that are very important to the copyright issue: stability, scarcity, solvency and market segmentation. All four of those things, stability, scarcity, solvency, segmentation—every one of those four—is gone now. Whether it's by technological change, business entry or government deregulation all kinds of business entry and business exit are characterized. You've got tremendous growth opportunities that have occurred. HBO did not go on satellite until 1976. It has now been more profitable than the NBC television network for each of the last three years and will be this year. Diversity. Abundance. But, most of all, volatility, instability.

And, across these, that whole big change focus, two things have emerged that did not exist before with which we now have to deal; one is project substitutability, the key thing for a businessman. The other is distributional substitutability.

Now, if you think of those two things and the range of interests represented here at this table, whether it's news, entertainment; whether it's series or movies, entertainment, sports, music, magazines, books, toys and games, these are now characterized by product substitutability as well as distributional substitutability.

For the consumer, which is what you people should be worrying about, this is basically a terrific environment because it offers the consumer all kinds of choices that he or she did not have before; you now have an unsegmented multi-media marketplace where the consumer can move in and out at various points where he or she wishes to intersect. There are pricing points, obviously, and all kinds of things that might force them in or out, whether it's free television versus pay television, videocassette rental versus sale, but you basically have an environment which is favorable to the consumer.

What you should not worry about unless you've caused it inadvertently is that there will be an increasing rate of business failure, and you're talking about media businesses and the media loves the media. The media loves the media more than they love the Senate or the House or the President. See, they love to write about themselves. Ted Turner announces a new business that employs 50 people and it's on the front page of every newspaper in the country. Citicorp rolls out a new line of business with God knows how many people and it is on page 47. In sum, the attention that new business and business failure get in the media, and I include in that the entertainment world, is enormous. And you should not be worried about people saying that because they will fail, you should make some adjustment, and I'll explain that in a minute.

Examples of risk failure are just starting to emerge and you're going to see bigger ones. CBS had one of the first early ones. We had a cultural cable operation we started. It failed. It was $30 million lost. This year, Time lost $50 million, I believe, on a magazine that was going to marry publishing, computers, and cables, and the cable industry, and that has died. Also, this year, Time closed a $25 million effort in Teletext. The newspaper in your own city of Washington last year pulled the plug on a narrow sports magazine and has now bought a sports pay channel.

The biggest risk potential failure will be this year with RCA and the videodisk. This is clearly the last year of trial. The company has put $400 million into this effort. It is the largest, new, high-technology, new effort by a company in the last 10 years, and this is the trial year.

Now, in terms of taking this very different business environment, with people who spend a lot of time lobbying you people, what we think at CBS is that the government, in terms of copyright, ought to have three goals because you've got a copyright world that reflected scarcity, solvency, stability, and the kinds of things of eight or ten years ago. And you had the creative and business elements interacting. Basically, it was a fairly stable world, and things really have not gone awry or become problematic until the last five or six years.

What we think, in terms of the best things to do are that you ought to have a regulatory structure that will allow companies to price their products as close as possible to marginal cost. Doing so would be clearly pro-consumer, for it encourages greater consumer acquisition of product. Clearly, you shouldn't have a copyright strategy which undercuts the incentives to price as closely to cost as possible. A number of examples where that happens have already been mentioned here: the copyright regulatory regime which encouraged home taping of audio and video products; transborder data flow; simply put, the whole mess with Canada, examples like that. Simply put, you ought to have a copyright structure that tries to encourage innovation.

The best example is the FCC's change, and this is sort of like a copyright change, in how distributors were allowed to go up on transponders on satellites. In the past, transponder usage was tariffed. It used to be a tariff kind of process. In the last year, the FCC has gone to an auction process, basically a marketplace process. As a result, you've got ten times more satellites up and fifty times more service by transponders.

Now, that kind of approach serves us at CBS best, because then we can make a rational decision about pricing, or entry, or whatever. What you don't want to get is a copyright regulatory structure where the regulatory lags create, because of their disincentives, a vested interest which then groups around the regulatory disincentive, an interest which would be disadvantaged if the regulation was made for competitive. And the classic situation there is the taping of audio records which isn't terminally serious yet, because you don't have record rental in the U.S. like in Japan, but has become serious in the whole videotaping first sale struggle. Disincentives like those disadvantage companies from expanding new investment in additional products and hence are disadvantageous to the consumer.

Finally, I want to reiterate the point about international problems. The head of our company 'Tom Wyman' is a member of the United States Trade Representatives Advisory Board; as such, he represents the communications, entertainment, advertising, publishing industries, we have interviewed 55 heads of companies in those areas, the biggest companies. Their biggest problem in terms of the whole trade services issue, they tell us, is the failure for both existing products, and more importantly, for new products that they want to bring on line, is the failure to get internationally adequate copyright protection.

Thank you.

Mr. Zuckman. Thank you, Bill. We'll have more time to talk about the international problems during the cross-discussion.

Our last speaker is Clyde Washburn, who is chief scientist of Earth Terminals, Incorporated, a manufacturer of satellite telecommunication reception products, based in Cincinnati. He's serving his third term as elected Director of SPACE, the Society for Private and Commercial Earth Stations, and is also a Governor of the Television Viewing Rights Superfund, organized by SPACE. He has served as technical liaison to government agencies and satellite program suppliers.

Mr. Washburn.

Mr. Washburn. Thank you. When I was asked to participate and prognosticate a bit, my first thought was one of our board members in SPACE is Professor Taylor Howard, from Stanford, who was asked in, I guess, the late 50s, to predict the future of electronics for SPACE. And at the time, the best that they could muster up was a prediction of very small vacuum tubes. [Laughter.]

So, realizing our limits at looking into the future, I'll try.

One of the major things that we see going on is the shift toward digital formats for most entertainment products, just now starting with music, with the laser disk, and also video, and of course, teletext and things of that sort. What's so significant about that is that once you have fairly widespread digital formats, you have the ability to sell and distribute a wide variety of what you might call background services. Once you've digitized information, you can transmit it at any data rate that you can conveniently handle, so that, as an example, you can subscribe to a record of the month club that might come in via your cable, and quietly, while you're watching cable, over a period of perhaps a day, accumulate a record's worth of digital audio information which could then be played back as normal audio. So this door is opening, as all of the formats are going to a digital format.

Cable and DBS are going to be the biggest players in that, from our perspective, because, basically, if you're going to send a lot of services, you'd like to have a lot of bandwidth. The premier contender is satellite distribution in general, and DBS, Direct Broadcast Satellite, because there is quite a bit more bandwidth available than almost any other medium.

When we think about these services being—this type of service being distributed, and the ones that we presently have, the first issue that came to mind is one that Fred Weingarten touched on this morning. We have a notion in this country of universal service for things like telephone and broadcast and newspaper. The idea that basically anybody that has the price and the interest should usually have access to copyrighted material. Unfortunately, we seem to be losing that with some of the new means of communications and we're developing a problem of what you might call a two-class society, of the urban and the suburban, that have access to cable and other forms of mass media—modern mass media distribution, and the rural, or economically uncableable American family, who basically isn't being touched by any of these things. And our telephone system is capable of only such very low rates of data handling that it really doesn't significantly—it isn't a significant portal to the household for new information services.

DBS, Direct Broadcast Satellite, that we read so much about is not going to be a full solution and there's a number of problems that I could tick off. One is, of course, that it's not in place yet. And what we read most recently tends to be in the nature of small and large setbacks for the schedules that everybody had originally envisioned.

There's a very high start-up cost involved, because it's a whole new technology, and that's going to tend to limit the number of services that can afford to get involved at this point and, therefore, the number of services that can be distributed in that manner.

For the rural American, there's a technical problem that isn't too widely appreciated, and that is the direct broadcast satellite service tends to be bothered by rain. Perhaps not so much of a problem if you're watching a television broadcast, a video broadcast, but if you're using it like a high speed data line, like a dedicated telephone line to, as an example, bring commodity quotations into your farm for the business end of our agribusiness activities, that lack of reliability isn't really fully addressed.

And other problems of initially limited programming and the apparent inability of many of the participants to get together on some sort of format standardization, technical format standardization.

What's interesting is that while all this is going on, there's a parallel system in place right now, and that is four gigahertz satellite reception. There's been a few references earlier to it; unfortunately, usually in the context of piracy, but what's interesting is that we're talking, for the copyright holder, about a lot of money that's sitting on the table yet. The trade association that I'm on the board of has a standing offer of over three years duration to do whatever is necessary to make the financial connection between the people that hold the copyright on the entertainment material and the people in rural America who have satellite television as their only means of getting the programming.

We have made every other overture we can think of, one of which is offering to serve as a clearinghouse for standardized program encryption, good MIL spec, you might say, high grade, modern encryption that can guarantee the integrity of the program material and can solve problems like local blackouts for sporting events. We're quite sensitive to all of those issues, and would be happy to technically coordinate them.

I'd also mention the Carribean problem, where American satellite communications and entertainment is being intercepted without authorization. We as an industry are sensitive to that, and are very happy to help the copyright owners close the gate. Everybody, I think, knows deep down in their heart that there won't be quality programming to watch unless the people who make it get paid for doing it!

So we do wince a little bit at the references to piracy. There's a lot of the Dakotas out there. There's a lot of people in this country a hundred miles from the movie theater. We're really asking them to live in a very unmodern fashion unless we can address this issue.

Thank you.

Mr. Zuckman. Two of the panelists touched upon some of the international problems of interception of satellite transmissions, and I wonder if we could start in the 15 minutes or so we have for cross-panel discussion with some further commentary on the international problems, which will hopefully be of interest to members of Congress and their staff.

Bill Lilley, I wonder if you would pursue just briefly that problem you finished up with.

Mr. Lilley. The problem is enormously interesting from an academic or analytical point of view. Companies in the communications business, the entertainment business, the publishing business, and the advertising business are beginning to have serious problems abroad because other countries have neither our freedoms nor our copyright protection—whether it is unauthorized distribution of ET videocassettes before ET was on videocassette in the United States—apparently, they sold over a hundred million of them in Great Britain. The problem is exacerbated in almost every country because we have such different laws and constitutional protections governing the way we—whether it's news or even entertainment programming—is delivered. Also, in many countries and I include most European countries, many of these businesses are run by and often owned by the government. So that the range of problems, such as the stripping of advertising, or restrictions as in Germany where children can't be used in advertising. The problem is two fold. There is no American-type protection for the old kinds, the segmented businesses that I talked about first; exacerbating the problem is the lack of protection for the new businesses that represent merges of types of technologies and products. Very few countries have copyright type laws governing new technologies, witness the Caribbean Basin where HBO signal is routinely lifted "legally" without compensation, I guess Jamaica is the worst example.

What more I can say except it is a very serious problem. The one effort that Congress made, with Canada, to try to remedy the situation has become more inflamed because we retaliated on the tax side, and they retaliated by toughening up their law, and it's a very serious problem and will begin to affect—I mean, Mel Harris had a very good example, that the things that are being stolen or somehow deflected or diverted or drained are the things on which we make a lot of money. They're not stealing the things which are the dogs. It is hard to prove the harm, but it will become an increasingly serious problem. It is already a serious problem. Those four industries, we don't work together usually, we're not good at dealing with government, and that exacerbates the problem further, and usually we're fighting with each other before we go to the government.

Mr. Zuckman. Anyone in the panel have any other comments about the international situation before we move on? Yes, Gus?

Mr. Hauser. Yes, just a brief comment that as cable and satellite developments move forward overseas, particularly in Europe, I think there'll be a greater and greater appetite for American programming, which will get over there somehow, and possibly the theft problem will be even increased on that basis.

I was thinking, though, of programming coming inward from foreign locations. We have the ability now, not only to present a lot of programming that never otherwise would appear in this country, because of channel capacity, but also to provide separate audio tracks behind video programming simultaneously so that, for example, you could show a French motion picture with three different language dubbings—English, Spanish, and whatever the audience that's watching it. I'm not a copyright expert and I don't know what the rules are about manipulating the information that has been received here by a cable operator and in effect putting—inserting another language track, but it would be certainly advantageous to do that.

Mr. Zuckman. Clyde, did you have a comment?

Mr. Washburn. Yes, I think manufacturers would tend to see the problem as a failure to monitor technology. I'd liken it to the deliberations of the Federal Reserve Board being broadcast in the a.m. broadcast band and then noticing that there was a problem that people were eavesdropping. The technology of reception has become so commonplace, and I think the technology of control was developing alongside, but we were very late in recognizing the need for the control.

Mr. ZUCKMAN. Fine. All right.

PANELIST. If I could add just one thing, and this is a real dozer, bureaucratically, but one of the problems that really makes this international situation worse is that there is no home for it in the government. It is divided between the State Department, which has different interests; the Federal Communications Commission; and the USTR; the Commerce Department. There's an office in the White House that fools around with it. And I don't know—I guess there's a lot of congressional committees that are involved in it, but the thing is just all over the place, and nobody really focuses on it.

Mr. ZUCKMAN. Yes, Mel.

Mr. HARRIS. I just want to reinforce the point that more and more of our exports are going to be copyrighted material instead of wheat, beef, automobiles. And the jobs that that provides in this country are going to increase sizably, and that's why I think this focus beyond just the immediate thing is a good long-range one in terms of our long-range economic interests as a trading partner in the world, because we haven't been particularly good at making money off of the new technologies yet. Somebody else has been doing that, and now money's been going to different countries for it.

Mr. ZUCKMAN. All right, thank you. One of the panelists touched upon the problem of lateness in reacting to some of the development of user interests and some of the new technologies, and it has been alluded to throughout this symposium. And so, I'm wondering what the panel's reaction is to this: given that legislative and judicial solutions to copyright problems created by these new mass technologies may not be sought until after user interests are created, do you have any suggestions for the Congress, for the Copyright Office, on monitoring these developments and perhaps getting ahead of some of these problems before they become problems. Anyone care to comment on that? Yes.

PANELIST. I'm glad you used the word "monitor," instead of "legislate." One of the things that I think has characterized the development of law in this country is that it is reactive, and tends unnecessarily to follow what is rather than hypothetically what may happen. It's very difficult to predict the future and to legislate about things that have yet to be developed, and the risks of really terminating all development or, in effect, freezing things into a mold are very great.

I think the developments that we're talking about here at this conference are largely due to a system that has permitted a totally free development process without—essentially without serious restrictions on the ability of people to innovate and take chances and try new things, step on somebody's toe, but nevertheless, it's all worked itself out in time, so my thought is please don't overreact. Have patience. Monitor. But let some of these things correct themselves.

Mr. ZUCKMAN. Would you agree, then, with Bill Lilley about not being too concerned about the failure—or even substantial failures in the marketplace of some of these companies dealing with new technologies and new delivery systems?

PANELIST. Well, the so-called failures in the marketplace are normal to every kind of industry and I don't think that's a matter of concern to anyone except those who failed. It's their money, and if they were foolish enough to invest it and make a mistake, there's no way the government or any legislative process is going to protect them.

Mr. ZUCKMAN. Yes, Bill?

Mr. LILLEY. I'm distressed that Gus thought what I had said was an encouragement for the laissez-faire approach on the part of Congress or the Copyright Office. I think that, perhaps it's my training in economics, but I think that one of the jobs that you have to do is that you have to realize that the kinds of apparatus that copyright represents is regulatory apparatus, and no less powerful than the most powerful EPA rules, or OSHA rules, or Federal Reserve rules, and it is well known—gosh knows, we've heard all about it in the 70s, how regulations drive up costs, and I think it is imperative that people that are charged with being responsible for copyrights see it as a regulation of some kind. And that it be administered with a sensitivity to its cost and pricing impacts that it's having, particularly because you want to have a regulatory structure that is pro-consumer, and you've got to be sensitive to that.

I, coming down on the plane here, read the Senate Committee report on the audiotaping bill, and I'm reading along and at the end there is this blythe one-sentence impact submitted by CBO, saying that this bill has no regulatory/inflationary impact. We all know the law that was put in and nobody really pays attention to it, but of course it's going to have real impact. It's probably going to be salutary, but it shouldn't just be an afterthought. That should be a very important part of your business.

Mr. **Zuckman**. Yes, all right. Clyde, and then . . . Mr. Berman?

Mr. **Berman**. Yes, I had one question for Mr. Hauser. I think—I'm concerned about, first of all, no one's answered my question, which I think is on the minds of some about whether we need new copyright protection. That's an injury question, or the incentive question.

But then, on the other hand, let's presume you do and the question is what kind of scheme do you put in to protect copyright with the new technology? One is the technical solution. That was discussed this morning and no one seemed to think that in the near term that technical solutions are possible.

The other is a licensing scheme which raises price questions for the consumer. It's going to cost more for a lot of buyers.

But then Mr. Hauser was getting to another set of controls, which he called monitoring. Segmentation of uses. You were saying that some of the problems to be worked out, and I'd like you to elaborate—is that to keep track of each use that a consumer makes of his television set or his audio equipment or his cable or his telephone or his computer, so that you can bill that person? But you would also be maintaining a record of every one of their transactions?

Mr. **Hauser**. Yes, we were talking, I think, about monitoring in a legislative sense, developments in the copyright field. You're addressing yourself back to the technical question of how individual use of program material can be quote, "monitored," which is just a way of describing keeping track of usage and, therefore, charges made on a per program or per use basis. And there are technical developments that we probably don't have time to get into that are very encouraging, and some of them were discussed last night, involving the self-destruction of material after a period of time, the use of particular decoders. We've come a long way already in the cable related business in terms of traps and addressable—computer-addressable equipment that permits this kind of billing so at the end of the month you would send the consumer a bill, just like the telephone company does for long distance.

Mr. **Berman**. Let me just make my comment first, for the ACLU, which is that in this area we're really concerned about the privacy question that are raised if a policing mechanism which is going to police the individual user and their uses of this technology across a range of media uses, banking transactions, shopping. You're putting together the potential for really computerizing and recording total life transactions of people.

Panelist. We have to be very sensitive to, and I believe everyone is. It's not a new subject, but I don't think there's necessarily any invasion of any personal privacy on an involuntary basis.

Mr. **Zuckman**. See, we have the interaction beginning with the audience, and at this point I want to entertain questions and comments from members of Congress and their staffs. Senator Mathias?

Senator **Mathias**. The question of timing has arisen in this panel and I think that's an important question for the Congress. We could obviously act too soon, and act on the basis of insufficient knowledge, insufficient experience. On the other hand we might wait so long that it becomes really politically imposible to do very much. Take the Betamax case. It's, I suspect, marginally possible to do anything about the Betamax with ten million machines operating in the United States; when there are 50 million that will become much more difficult. Now, what is the time frame? Should it be a graduated scale for different elements of this whole technology, or is there some point at which the problem becomes so massive that there really can't be anything done?

Mr. **Zuckman**. Mr. Washburn?

Mr. **Washburn**. Yeah, I'd like to comment on this one, especially because we have a lot of what you might call software people represented, but I would like to take the perspective of the hardware manufacturer. I think it's maybe more important for the hardware manufacuturers to see regulation of problems occur, if possible, ahead of the fact or at least not long after. And the simple reason is that we deal with physical inventory. We can have millions of dollars worth of hardware that is suddenly unsaleable because some problem was recognized that the hardware contributed to.

In the case of the software vendor, the legislation tends to improve his revenue recovery. Particularly from the point of view from our industry, it's enormously important, because it's one of the few areas of electronics that is American dominated today, and it would be hurting almost exclusively our own not to legislate early enough to get orderly compliance.

Panelist. I think the tragedy, Senator Mathias, is that what's good for the hardware industry is probably—and for the people that work for it, or are employed by it—not good for the software companies or for the consumers that buy the software. What really drives all of these businesses is not the hardware, but it's the software that they get. And that's what the people really buy.

We've done all kinds of surveys, CBS, and people don't know the difference between cable, pay cable, network television, independent stations—they all think they're watching something called television, and they acquire the products. And we have seen—pay television in this country, we have the worst television service, 525 lines, even the British and the French have much better television because they don't have the rigid standards that were put in early in this country, 1953 standards, around which the whole industry grouped and built terrifically cheap sets. But you depress the level of quality, and I think you want to act later, rather than earlier, to let the people—to get that software on line because that's what the people are going to buy.

And in that regard, I would mention that you would want to monitor for these kinds of price enhancement or sort of dislocation effects that when you begin to have a regulation in one area of the copyright affecting either a new product or an old product, that becomes harmful to the consumer for either of those reasons, I think then you've got empirical evidence that that regime should be adjusted in some way. Not for the software or the hardware persons, but for the person who's trying to acquire the product. I think that—the split between the pricing in the sale and rental of videocassettes is the kind of thing, and if you read your report on the audiotaping, you say that it is a very good thing to pass the audiotaping bill now, because with the compact disk coming on line this year, which is going to cost $20.00, which can be played indefinitely, millions of times, without any impairment in quality or sound, that you would have a record rental business springing up like that. So you adjust it fast there, but you've got really already the same distortions that you're guarding against in the video field.

Mr. **Zuckman.** Mel, did you have a comment?

Mr. **Harris.** In terms of timing, I think that I will agree with Mr. Lilley that some things are going to have to be dealt with as they occur or expose themself broadly enough to need to be dealt with. But I am concerned that in that waiting period, there not be a reinforcement with the American public that copyright is a property right and it is stylish in America today to steal cable television signals. Gus will tell you. It may be as high as 30 percent in New York City, by itself. Between 15 and 20 percent of the homes do that now, and it's almost stylish. "You mean you're paying? Well, fool, why are you doing that?" And I don't think that if we let that kind of attitude become pervasive that we'll have much success with whatever we choose to do on future issues that are more segmented, finite, and perhaps even special interest serving.

Mr. **Zuckman.** I'd like for other members of Congress and their staffs—Congressman?

Response From Audience. Yes, I might say that I'm very sympathetic with Congress, you know, not rushing into something, but the Betamax case is very much an exception. Up till then, the Federal courts rush in if we haven't acted and then, with our natural disinclination to get involved with controversial things we don't have to get involved in, we let the court legislate. So I just think we can't—there's a fine balance between how long we can wait before the Federal courts activistically view this as an area in which Congress has not acted so they legislate.

Mr. **Zuckman.** Anyone like to respond to that comment?

Response From Audience. Yes. Yes, this is a matrix of problems. I was suggesting that perhaps no wholesale approach to copyright be taken at this point to change what is, without knowing what's coming. Yes, the courts may step in, that's a peril. But the perils of moving in and doing something wrong are equally great. There are certain things, perhaps, as a factual basis that need attention: signal piracy on cable. We're asking for legislation; we're getting it in state legislation, largely.

You might well ask yourself whether home video, VCRs, would exist today if legislation had been enacted years ago in some direction. Maybe this industry would never have happened. You never know if you're right. You may do something and perhaps even in the question of audiotaping, and whether or not a rental business will spring up. We don't know. And, perhaps, we would stifle some business by acting in some direction now, with the future unknown. So there's really no answer, except to be cautious.

Mr. **Zuckman.** Are there any other questions or comments from members of Congress or their staff? Yes, sir? Would you identify yourself, please?

Mr. Podesta. Yes. I'm John Podesta from the Senate Judiciary Committee. I want to address a question to Mr. Lilley on the international copyright issues. You mentioned the fact of retaliation against Canada and suggested that that was a counterproductive strategy, although I don't think there's actually been any retaliation in either the tax or copyright policy. There's been a suggestion of it, but——

Mr. Lilley. Well, I'm sure all the Congressmen know about the convention tax change that we put in, what was it, four or five years ago? Where we disallowed the number of conventions that you could go to and have tax deductible per year in North America. It's down to one convention now and it used to be unlimited. Apparently it was very damaging to the Canadian tourist business from here. That's what they say.

Mr. Podesta. That doesn't seem to have worked. You talk about Jamaica. We've tried the Caribbean Basin Initiative. That seems to be potentially more successful. And you also described the problem of separation of authority between the—amongst the various agencies of the federal government, and that no one has the lead on these issues. Do you suggest the Congressional role that you think ought to be, in trying to hold this together and focusing attention on the growing problem which you describe as being at the forefront of the minds of 55 corporate executives that you dealt with.

Mr. Lilley. Well, let me give you the good news and the bad news. The good news is that I think that the problem that we've just—that all of us alluded to briefly here at the end—is one of the most politically glamorous, politically sexy, interesting, because it's about parts of the media, the media is very caught up in it, it's very pro-American, it is one of the areas where we are clearly the world leader and have been ever since—because we do things, because of the First Amendment and everything that other countries don't do, and this is one of the things this country is just passionately supportive of. Consumers consume these products, they're intensely proud of them, so it should be an area ripe for political leadership. There isn't a visible down side, because everyone is proud of these things and the Europeans and the South Americans want to consume them, even the communist countries want to consume these services or products. That's the good news.

The bad news is that the companies that make these products or distribute these products usually spend most of our time fighting amongst ourselves in your offices. That's problem one.

The second problem is that historically, the executive branch is badly divided over this thing, and the State Department, which has the lead, has another agenda, which is usually making the countries feel better about themselves and not worrying about getting these products distributed.

And I think it is organizationally very difficult—I dont know what committees have responsibility. I guess Finance and Ways and Means have responsibility, but they don't exercise it. They don't have an intellectual interest in it, like your committee has.

So it's a wide open field. You've got these big companies that are employing a lot of people to do these kinds of things, that are trying to distrubute them are having problems distributing them, and no one is doing much about it. And you are the people who can do something about it.

Mr. Zuckman. All right, Congressman Sawyer again.

Mr. Sawyer. Yes, I would like to ask Mr. Lilley, I'm not aware of any law that limits the number of conventions somebody can go to. I know there's one that limits it to the western hemisphere, but I'm not aware of any new national limitation. Do you have something specific in mind?

Mr. Lilley. Bob, tell me if I'm wrong, but isn't that Northern American restriction still in? That if you go on a business convention, Congressman, you can only deduct in North America——

Mr. Sawyer. Well, I've said, within the hemisphere, but not the number.

Mr. Lilley. Outside the continental—outside the United States, in North America, you can only go business deductible to one convention.

Mr. Sawyer. I'm not aware—I never heard of that before.

Mr. Lilley. And it was put in to retaliate——

Mr. Sawyer. I learn something every time I come to one of these. [Laughter.].

Mr. Zuckman. Let me open it up. Canadians are very bitter about it, now. We only have a very few minutes left. Congressman Kastenmeier.

Representative Kastenmeier. I've just got one simple question to ask of Mr. Washburn, who seems to be soliciting both early resolution of his problems; namely, to submit his hardware industry to some form of royalty or some form of agreement if he can get it, but there doesn't seem to be any response on the part of the proprietors.

Panelist. You noticed that, too? [Laughter.]

Rep. Kastenmeier. I'm saying that's what you asserted, and that seems rather curious, in a sense. There are a number of legislative proposals on the table, but that's not one of them. I wondered, Mr. Washburn, what the state of affairs was and why proprietors are unwilling to subject direct broadcast satellite systems to copyright—to some form of agreement wherein they can derive royalty.

Mr. Washburn. I won't try to explain for them what the reasons are. I can only say that with some certainty, since I've been continuously on the SPACE Board of Directors since the offer has been open, that we have never received a serious proposition to, you know, accept or reject, and the offer is continuously open.

Response from Audience. Who do you consider the owners, the proprietors of material, with whom you ought to be dealing?

Mr. Washburn. All of the suppliers of—well, let's put it this way. The major suppliers of high-grade entertainment products on satellite, which would include HBO, Movie Channel, Showtime, et cetera.

Mr. Zuckman. Let me just apologize, Congressman Kastenmeier for not recognizing you by your name. But we have time for——

Response from Audience. But I do believe that's a question that deserves an answer from a product supplier, at least. I think as you phrased the question, there is not a problem. When you say "direct broadcasting satellite." The difficulty that has existed in the near term past has been that these were not direct broadcast satellites; these were intended to be point to point communication vehicles going to head ends of cable systems or to broadcast stations for dissemination when they were received. And the rights for direct broadcast satellites have not been granted to those program entities, the HBOs, the ESBs, and whatever else they were at that time.

Direct broadcast satellite is now here. We have one in operation; yes, it has a rain attenuation problem. That's because it's operating on a low power. There are several other direct broadcast satellites. I don't think that you would find that any product maker or program supplier wants to deny any portion of the American public access to their service, but it is a manner—partly what you said, Gus, and that is, you wait for the right thing to get there to get it to serve them.

Is that any help?

Panelist. I would make one comment on that, and that is that we understand that the existing providers may not have DBS rights to the product. However, as long as about three and a half, probably four years ago, we were asking the people who are handling it now to resolve that, to request those rights, to let us know what the price was. We appreciate that the chain has to go back to the original creative rights owner, and we would like to do whatever we can to forge the links.

Mr. Zuckman. Prerogative of the last question to one of our hosts, Mr. Ladd.

Mr. Ladd. I've decided that I don't understand my own questions, so I yield. [Laughter.]

Mr. Zuckman. One very quick question, and one very quick response. Mr. Abbott?

Mr. Abbott. Yes, there's a lot of reference to signal piracy. Well, as you may be aware, there's a proposed satellite convention which the United States may or may not eventually enter into which arguably could solve some of these problems, whereby each potential signal port would agree to protect from piracy the signals of others. Of course, it remains to be seen what will happen there.

Quick question. Mr. Lilley mentioned marginal cost pricing. Of course, marginal cost pricing of videotapes would be the price of copying, so I wasn't exactly sure of that reference. I mean, it may be socially optimal in some sense, but it's not price—marginal cost pricing.

Mr. Lilley. No, I must have misspoken. I think that you would want a regulatory structure in place that would foster the kind of marketplace competition that would tend to drive price as close to marginal cost as possible, and not create either an artificial barrier to that downward pressure.

Clearly, when you go below marginal cost, nobody is going to make it.

Mr. Zuckman. Now, I promised the chairman of the next panel that we would vacate as close to the mark as we can, and we're at this point. Let me thank very much the panel today, but also, Mr. Ladd and his staff for persuading these extraordinary gentlemen to come together with us today and give up their weekends away from their homes. I think it's just been extraordinary. [Applause.]

Mr. Leibowitz. As I noted this morning, Judge Breyer began to open the Pandora's box of questions concerning the administration of rights in new technologies. There are various types of administration systems now in operation, from individual licensing, blanket licensing, government intervention, private licensing.

Today's moderator was supposed to be Professor Alan Latman from New York University Law School. Professor Latman, unfortunately, was not able to join us today, and it is a great loss to all of us that he is not here to share his wealth of wisdom with us. There are very large shoes that had to be filled. However, we have our Rapporteur, Professor Goldstein, whose feet are rather large, too, and we hope will be able to try to fill Professor Latman's shoes. [Laughter.]

As you heard in the introduction to Professor Goldstein yesterday morning, he is a professor from Stanford University Law School, a noted educator in the intellectual property law field, and is the author of the textbook "Copyright, Patent, Trademark, and Related State Doctrines." He is also a former winner of the Nathan Burkan (phonetic) competition when he was in law school, and I was fortunate, when I was a law student, to take four different courses with Professor Goldstein, and I am very grateful for the knowledge that he gave to me, and I'm sure that we will have more knowledge to give to all of you.

Professor Goldstein.

Mr. GOLDSTEIN. Thank you, David, that was very kind. The subject of our last panel of this session is the Administration of Rights in Copyrighted Works in the New Technologies. The members of our panel, moving from my immediate left to the distant left, are Thomas C. Breenan, Chairman of the Copyright Royalty Tribunal; Harlan Cleveland, Director of the Hubert H. Humphrey Institute of Public Affairs, Unviersity of Minnesota; Alexander Hoffman, Senior Vice President, Doubleday and Company; Professor John Kernochan, Columbia University School of Law; John C. Taylor, III, Chairman of the Carnegie Corporation and a partner in the firm of Paul, Weiss, Rifkind, Wharton and Garrison; and George Willoughby, Vice President and General Counsel of King Broadcasting.

Let me begin quite briefly by describing what the members of this panel are not going to talk about. They are not going to talk about how, if at all, the information created by the new technolgies should be protected. That topic has already been considered in some of the earlier discussions and will not be rehearsed here. Rather, our panelists will address the problems that the new technologies create for copyright owners of all forms of information, both traditional subject matter and new subject matter. Specifically, they will consider problems that the new technologies create for policing the uses of copyrighted works by such undetectable and decentralized as photocopying and performance, to take two of the more traditional examples.

In this context, the central question that the speakers will address is whether the common perception—that the new technologies have rendered copyright in many respects obsolete—is in fact a misperception. Do mechanisms exist, and can mechanisms be created in and out of the marketplace, that can overcome the problem of decentralized uses, both effectively and fairly?

Our first speaker, is Thomas C. Brennan, who is Chairman of the Copyright Royalty Tribunal for a second time, after having served as the first chairman at the inception of the Tribunal in 1977. After earning his J.D. degree at Georgetown University, Mr. Brennan served as Chief Counsel to the Subcommittee of Patents, Trademarks, and Copyright, U.S. Senate Committee on the Judiciary, during the time that the new copyright legislation—the 1976 legislation—was developed. He has served as a member of the Board of Trustees of the Copyright Society and as Chairman of the Committee on Patents of the Administrative Law Section of the ABA.

Tom?

Mr. BRENNAN. The former Register of Copyrights, Barbara Ringer, in a 1977 law review article, posed the following questions. Does our experience in the development of the 1976 Act suggest that in the future whenever a new right is granted by Congress it will necessarily be subject to compulsory licensing? Does this mean that eventually compulsory licensing will supplant traditional copyright and that all rights under a copyright law will, in time, consist entirely of the right to collect royalties?

Miss Ringer continued. "These troubling questions must be asked in the light of another even more portentous development. The Copyright Royalty Tribunal," she wrote, "is in many ways a sensible and ingenious device for making the various compulsory licensing schemes work efficiently. At the same time, the existence of a government body that is paying out royalties, settling disputes among copyright owners, reviewing royalty rates, and deciding the terms and rates of licenses seems an open invitation to further government control. All this bears close watching in the months and years ahead," end of quote.

It might make for a more exciting session, but I do not have any fundamental difference with that portion of Judge Breyer's remarks this morning relating to regulation and government involvement in licensing schemes. Government intervention should not be seized upon as an easy answer and a convenient solution to dispose of complex problems. But, the more difficult question remains, are there circumstances in which some government role is appropriate as a necessary last resort? And what is to be done with the many details inherent in licensing schemes that neither the Congress nor the courts wish to handle or should be required to handle?

I was surely not invited to take part in this program because of any jurisdiction of the Copyright Royalty Tribunal relating to new technology. I shall limit my remarks to some observations on the Tribunal's experience with the fixing and distribution of copyright royalties in those situations where user industries discharge their copyright obligation by a single payment.

A useful starting point is the relationship between private licensing and collection agencies and the existence of some form of governmental mechanism. Nothing in my Tribunal experience suggests that private agencies cannot assume the dominant role in the administration of rights. Where such private agencies did not exist, the Tribunal in performing its royalty distribution functions under the compulsory licenses, has found it extremely useful, indeed essential, to encourage the creation of ad hoc collective agents. If the Tribunal was not able to coordinate its distribution functions with informal coalitions of program suppliers, sports leagues, and commercial broadcasters, it would have been impossible for the Tribunal to perform its distribution functions within the rigid timetable established in the Copyright Act.

After a period of testing and experimentation, the distribution system is functioning. And now, many matters are routinely processed. While the existence of private agencies has been essential to the viability of the Tribunal's operations, it is also clear that the compulsory licensing scheme could not operate without some form of government mechanism.

For example, sports leagues and commercial television stations have fought for years before the Tribunal over their respective entitlement to that portion of the cable television royalties assigned to the carriage of sporting events. How would a cable operator have been able to confront this issue in the absence of some governmental mechanism? I believe that the most appropriate role of any government function in this area is to be available to resolve rate and distribution matters only when the parties are unable to do so. Through its procedures, the Tribunal has encouraged voluntary agreements. In doing, so, we have built upon the approach taken by the Congress in the public broadcasting compulsory licensing. Any licensing arrangements negotiated by the parties should supercede any rates adopted by the Tribunal or any similar government agency.

Policy makers should take particular care in making decisions concerning the structure and scope and the jurisdiction assigned to a body such as the Tribunal. Perhaps some useful lessons may be gained from the Tribunal experience.

When the Tribunal was created in the Copyright Act, the Senate and House had differing views on the structure of the Tribunal. The Senate bill provided for ad hoc panels that would be established as necessary for particular proceedings. The House bill, which prevailed, provided for a continuity of membership. There are pluses and minuses to either approach, but I believe in the actual operations of the Tribunal, a hybrid has developed whereby within a formal permanent structure, informal dispute resolution has been encouraged.

During the consideration in the Congress of the establishment of the Tribunal, various user industries were successful in placing certain limitations on the jurisdiction of the Tribunal. The Tribunal's rate jurisdiction has been limited to reviews at five to ten year intervals, with no provision for relief petitions or any possibility of making adjustments to account for significant new developments. Presumably, at the time, such limitations were viewed as helpful to certain industries. I suggest that a case can be made that such limitations have backfired on their proponents.

It is only stating the obvious to declare that policy makers, to some extent, have either not anticipated or have chosen to ignore important technological advances which have impacted greatly on intellectual property rights. It is not sound public policy, on the one hand, to say that the future cannot be predicted and is fluid, and then, on the other hand, to create arbitration or dispute resolution mechanisms that are established in such a fashion as to effectively preclude consideration of developments which are essential to the determination of matters within the assigned jurisdiction.

If such mechanisms are to make a useful contribution it is essential that they have the necessary jurisdiction and be provided with the required resources.

Thank you.

Mr. Goldstein. Thank you, Tom. Our next speaker is Professor John Kernochan. As I indicated, he's a professor at the Columbia University School of Law. He was Executive Director of the Council for Atomic Age Studies from 1956 to 1959 and a member of the President's Commission on the Status of Women from 1962 to 1963. He presently serves on the Board of Directors of Volunteer Lawyers for the Arts, and he was Chairman of the Board of Galaxy Music Corporation.

Mr. Kernochan. I am.

Mr. Goldstein. Oh, the information sheet says you were.

Mr. Kernochan. Perhaps it knows something . . . [Laughter.]

My view of copyright concerns is a worm's eye view from the angle of the composer-author-artist with whom I deal constantly, especially in connection with Volunteer Lawyers for the Arts. At VLA, I regularly see and try to cope with the plaint of the individual artists and small arts organizations that can't afford effective legal service. And, in trying to do this and protect the copyright owners' interests, the creators' interests, one sometimes recalls what Mr. Justice Holmes indicated he felt in trying to deal with Mr. Justice MacReynolds: "How are you going to argue with a man whose major premise is always 'Goddamn it.' " [Laughter.]

This is the kind of arguing you run into when you're trying to deal for copyright owners with people who don't understand how intangible rights can exist in something that they hold in their hands.

In any case, I want to offer you a few observations to mull over. Incidentally, I hope that someday soon, and in accordance with what Ms. Hunter suggested this morning, we can stop talking about copyright in favor of using a broader term, "authors' rights." The Constitution doesn't use the word "copyright." And copyright is coming to be a more and more troublesome word and concept. So maybe authors' rights would be a better label for the whole subject.

I have a number of points to make. Number one, let's look back to first principles in the Constitution at the start, to clarify what we are really after with copyright. Both the Paramount and most recently, the Betamax decision, it seems to me, went astray on this matter, saying that the interest of the artist is secondary to some general and presumably distinct public interest. In my view, that's a license to drive holes in authors' rights under the name of fair use, First Amendment or non-infringement or whatever—whenever there's a loud public clamor for a particular use. I think the cases demonstrate that.

But, most importantly, the Constitution says nothing of that kind. The power given to Congress is a power to promote progress by giving authors rights. It's a power to do X by doing Y, and the only legislative history we have on that provision, written by its originator and proponent, James Madison, says that in this area the public good fully coincides with the claims of individuals—individual authors was what he was talking about.

What is now given authors, generally, is not the fair return for use of their work that David Ladd quite rightly says they should have. On this point, also, I think the Court was deluded in Teleprompter, which was quoted again in the Betamax case, where it was said that "The immediate effect of copyright is to give the author a fair return." All the evidence I'm aware of is that that is a false statement. Now, if you're talking about the aim, okay. That's something else. But the effect, no.

I agree a fair return is a desideratum, and I would suggest as a basis for our thinking that the ultimate goal of authors' rights is of assuring that worthy author whose work appeals to a significant public is decently paid for its use—so he can stand on his feet without dependence on government or patronage. Those of you who were here this morning heard me read the statement of Lord Macaulay where he said pretty much the same thing. We underpay and undervalue our teachers and lose quality in the process. Let's not do the same thing to our authors and, for that matter, let's stop doing it to the teachers.

Point two. I suggest our eyes should be on the creative individual. That's where the Constitution puts the focus. It talks about authors and Madison equates them with individuals. I'm not downgrading collaborative art, made possible by new technology, from movies to tv; but courts, and perhaps Congress, can be misled by the big companies—movie, television, cable, and other factors or parties in the copyright litigation that we read about—who do the most litigating and the most lobbying in Congress. It's easy to forget that the individual, the creative individual, is the key concern. We want more Mark Twains, Walt Whitmans, Aaron Coplands, Cole Porters, and Gary Trudeaus. But we must support many lesser talents to grow the top of the crop, represented by the names I've mentioned. So, for starters, don't give away the rights of authors to everybody who asks for them, form veterans to fraternities, to dance halls, to jukebox owners. Do mend the holes in the old sock in which authors keep their pay, and do provide for them to share in new revenues from their work.

Point three. We must not bury our individual creators in conditions where they can't bargain effectively with the behemoths and large economic powers across the table. Since individual licensing only works in a few situations, artists must be able to organize, monitor, negotiate, license, audit, collect and distribute effectively the moneys from the use of their work and to make themselves heard in the halls of Congress. We want artists' organizations that maximize creativity, self-sufficiency, individual autonomy, and allow for diversity and multiplicity.

Now, today, if artists organize in guilds or join organizations that maximize individual autonomy, they are clobbered with anti-trust suits and possible per se violations and treble damage consequences. For some twenty years, the blanket license of the music performing rights societies has been in the courts, and I think that it's still standing and still useful after twenty years. But stop and think about how much money, how many arts' dollars went into preserving that device, which still is with us today, without much movement. I venture to say that totting up the expenses for both sides in that litigation, we would have something in the nine figure area, and much of that money winds up in whose pockets? The lawyers' pockets, and not the artists' pockets. And it seems to me, it is a crowning irony that Congress pours money into the National Endowment for the Arts yet leaves standing laws that create arterial bleeding of arts' money—arts dollars—to the lawyers with little result in proportion to the time and the money spent and much economic loss to the arts.

Now, what to do about it? Authors can escape anti-trust consequences by unionizing but, if they unionize, what a price they have to pay. As union members, they are employees for hire and the copyright law takes away their authorship status under the work for hire doctrine, which is far broader than needed, in my view, for the health of the producers, who get that favored status of being the author, and is certainly far broader than is necessary or desirable for the optimum functioning of the creative process.

In a word, authors are between a rock and a hard place and a legislative remedy is needed. And here I must confess I'm not an anti-trust lawyer, but I think I know arterial bleeding and waste when I see it. I suggest that you give consideration (a) to allowing artists' guilds and organs a sui generis quasi-union exemption from the anti-trust laws. If you do this, there must be safeguards for the public and for users so that unreasonable restraints in rates or conditions do not result. And this should be realized through some speedy, expert, impartial, umpiring agency. We have a model in the ASCAP consent decree: ASCAP's rates can be taken to the district court and the court will decide whether the rate ASCAP is quoting is reasonable and ASCAP has the burden of proving that it is. There are other possible solutions. Chairman Brennan's CRT is one. There may be other solutions, whether it's arbitration or some still other separate tribunal that I haven't thought about.

Part (b) of what I'm suggesting is that you consider exploring, apart from antitrust, a cheap, speedy, expert, dispute-setting procedure or tribunal for copyright controversies. I think, in almost all the major law schools in the country, it is coming to be realized that the litigation model for dispute settlement is terribly costly, and the fact is that it's far too costly for the individual creators and even for their organizations. Again, you have the bleeding of arts' dollars.

In a particular copyright case, the economic considerations may be small, but the principle may be big, and the non-author party may have much greater, disproportionate resources to litigate and the capabilities to do it. Also, the concepts and the required proof of harm, which the courts seem to be developing against the good advice of David Ladd, should be revised down legislatively where infringement can be shown.

Now, those are concrete things for the new era of technology with which I think artists cannot cope unless as individuals they can organize properly, without antitrust prosecution. It isn't something new I'm suggesting here. There are bills pending before the Congress now which permit companies to get together for R&D and, reaching the intellectual property field, would exempt or would take away the per se violation rule and take away the treble damage remedy and rest with actual damage.

That's as far as I'm going to go now. Identifying the users and uses and modes for clearing licenses will be covered by others who follow me. I'd like to leave you with a thought which is a re-statement. Our goal is to assure through our law on authors' rights that authors whose work appeals to a significant public are able to live by their art, to stand on their own feet, independent of hand-outs, whether by government subsidy or private patronage.

If we could all learn not only just to be our own individual publishers in the new technology, but to be our own artists, painters, and composers, we could fire these people for our payroll. But most of us will never be able to do these things. We desperately need our authors, the best ones we can get. The worthy ones must be assured a fair living from carrying out their professional tasks. Congress must help bring this to pass, and I think some of the measures that we will be proposing today should move in that direction. There are others, too.

Thank you.

Mr. GOLDSTEIN. Our next speaker is John C. Taylor, III, Chairman of the Carnegie Corporation and a member, as I indicated earlier, of the firm of Paul, Weiss, Rifkin, Wharton and Garrison. He earned his law degree at Yale; he is a member of the Association of the Bar of New York City and its Committee on Copyright and Literary Property, and of the American Bar Association.

John?

Mr. TAYLOR. I had originally thought that I would start today by using as an example a conversation I had with Jack Kernochan last night out there in the hall, about a legal matter in which I was insisting very vociferously that the copyright belonged to the publisher, and he was insisting that it belonged to the authors—[Laughter.]—but after hearing Professor Zuckman today, I decided that would not be diplomatic. [Laughter.]

I'm also going to refrain from a great temptation to deal directly with the two very immediate matters which we all spend a lot of time talking about, the Betamax case, the home taping matter, and videocassettes. It was not mentioned that the way I happen to be here has nothing to do with my law firm or the Carnegie Corporation. It happens that I was invited to come here, just so there's no false pretense here, by the National Music Publishers Association for which I've acted for many years. And they are obviously the two matters that are of most importance today, in copyright legislation, to the National Music Publishers.

What I'd like to do instead is to look at some of the principles and basic approaches that can be used in trying to solve the problems that are created and presented by the new technological developments. I think there's a tendency to take each problem as it arises and try to react to it in a pragmatic way. As the new developments come with increasing frequency, that approach is going to make it impossible to arrive at a cohesive and consistent pattern of dealing with intellectual property.

As has been said here over the last couple of days, there are two principal objectives that have to be achieved: One is to encourage creativity, and the necessary elements of that, basically, are to give the author some fair control over the use of his work, and to compensate him fairly for his work. I think the example that Professor Kernochan used of what we have done to teachers in this country is an apt one. It's true that you really don't have to give an author a million dollars for writing a successful book to compensate him fairly. But authors as a group are always going to be undercompensated, and it's necessary to do something to preserve for authors a recognition and a status in our society so that bright people will continue to be authors. And what we've done with the teaching profession in primary and secondary schools by paying them too little is to put a profession which is regarded very highly in the eyes of every other society in a position where that profession is not well regarded in this country. As a result, you can't get enough really first class people to go into that profession.

The other objective is to facilitate access by the public to the copyrighted materials created. It seems to me the legislative objective should be to create and encourage an environment in which licensing of those works can be handled in an easy, fair, effective and quick way so as to make the material available to the public quickly, fully, and at an economic price.

There are a couple of dangers, I think, in the proposal legislation that has been mentioned here. I'd just like to mention them briefly. One is the danger of overlegislating, Legislating too quickly is perhaps one aspect of that. Another is creating a rigidity in the legislative structure which prevents the knowledgeable people who deal with the problems on an everyday basis from working out patterns of licensing and modifying them periodically to adjust them to the changing processes and the changing channels of delivery to the public as they develop.

The other was mentioned by someone yesterday, and I think is equally important. In drafting legislation that creates rights or creates restrictions, a high priority must be given to the method of enforcement. Creation of rights and restrictions without a really clear and effective means of enforcement does nothing but create confusion in the entire environment, and doesn't protect the rights of anyone. I think there's a great danger, particularly as these new technologies develop, of doing precisely that.

Not all of the new developments are going to be subject to the same type of approach, I'd like to use as examples three different types of new delivery systems for copyrighted material that have emerged as a result of new technology, and talk a little bit about how each can be dealt with.

The first is the easy one: New technological development that requires licenses which are big ticket items. There aren't many licenses required. There's a lot of money involved in them. They fit within more or less the standard pattern that already exists. And they don't require anybody to do anything. The marketplace can work those negotiations out on an ad hoc basis. It's economic to do the special negotiating.

An example of this type of development was the development of motion pictures. People started buying novels and plays and even music for motion pictures. That's worked fine without legislation.

The second type is the most difficult one, and it's the one that's coming up more and more frequently. It's by far the most difficult to deal with. It is a new delivery device with characteristics making it impractical to make the user pay for the use of the material delivered, and, in some cases, impossible to identify any specific use of a specific copyrighted work or to enforce a remedy against the person who uses it without obtaining a license. The classic example is home taping.

I would submit that it's not the only one around, and if you think about what's been said in the last few days, you'll find quite a number of other delivery systems that fit into that category.

Now, there are only two ways to deal with this category. One is to wait to see if further technological development pushes it over into what I'll discuss as category three, which makes it possible to identify the use and to identify what was used and who the user is and to create a remedy to keep him from using it without a license.

The second is in some way to create a pot of money to be used to compensate the copyright owner and then to devise a formula or process for dividing the pot fairly. It's a big order. It's a tough thing to do. But it can be done, and other countries have taken a crack at it.

What is the rationale for compensating the copyright owner—I suggest there are at least two. One is that you have to replace for him the revenue he's losing from the channel of delivery which is being preempted by the new technology. The preemption by home taping is real. I don't think there is any question. There have been any number of studies done. The Senate Committee itself, if I'm not mistaken, has concluded that the home taping of audio material has resulted in lost record sales of about a billion dollars a year. And that's money lost to the composers who are losing those mechanical royalties.

The other justification for compensating the copyright owner is simply that he should be given a fair share of participation in the new industry that's developing and out of which other people are making commercial profit.

Then there's the third category of new delivery system. I think the third one is the one that is overlooked most often. It involves licenses which have six characteristics. I'll list them, but first, in order to give the list some reality, I would like to suggest that a classic example is the licensing of music for use on videocassettes. I use that example purposely and I'll indicate why in a minute.

The characteristics are these. First, the use and the user can be positively identified. Two, there is a remedy which makes unauthorized use dangerous. There is a real deterrent to unauthorized use. Third, there are many users and there are many copyright owners involved, many of whom necessarily are unsophisticated about the economics of the industry they're dealing with. Four, many licenses are required and they involve relatively small amounts of money individually. Five, there is no existing pattern or established framework which is appropriate for licensing. And six, there are very rapidly changing market conditions and variances in the delivery channel itself.

All these characteristics apply to the use of music in videocassettes. They also apply, it occurred to me this morning, to use of software in the public schools.

Now, what do you do with that kind of situation, and what are the dangers involved? If you have those characteristics, there's no way that licensing can occur on any kind of sensible or effective basis until you create patterns and a framework for that licensing. Let's return to the example of videocassettes. There are lots of questions that have to be decided as to how you're going to license. Is it going to be a flat fee? Is it going to be a percentage? And if so, of what? Is it going to be worldwide? Is it going to be for a term of years? When do you license when the film's produced or when it's released in videocassettes? And what is the range of fair compensation, a question which obviously requires an analysis of the real economics of the industry.

The absence of a framework for licensing videocassettes has adversely affected everybody. It has severely impeded the development of the videocassette market. There is absolutely no question of that, and if you talk to any of the producers, they will tell you that. The result is that the public is denied the use of that channel as an access to copyrighted material. And both the producer and the creator—copyright owner—are denied revenues that they should be realizing from delivering that material to the public. Everybody loses.

I would suggest first of all that you can't deal with that situation by a compulsory license. I could go into why I think that, but I think we're going to—

Mr. **Goldstein**. I'd prefer you didn't.

Mr. **Taylor**. Yes, I've already run out of time. My suggestion for dealing with that is that there must be an environment created where the knowledgeable people on both the user and the owner side can sit down together, listen to each other's problems, practical problems that they have, learn the economics of the industry together, and arrive at patterns and ranges of consideration which can then be disseminated to the rest of the industry and can produce the framework for individual negotiations which can then be carried on. An antitrust exemption would almost always be required.

Dr. Spurlin said this morning that the major suppliers are the people with whom he'd been able to work out effective and workable licenses, giving support to this approach. The closest example of this approach is the one that Tom Brennan referred to. When Congress passed a compulsory license for public broadcasting, they were smart enough and wise enough to put in the anti-trust exemption. And what actually happened was that the public broadcasting people and the owners of the copyrights sat down and worked together and listened to each other's problems and, in fact, the licenses that were granted, at least for music, went far beyond what was required by the compulsory license.

Tom and I, I think, would disagree with respect to whether that negotiation would have taken place successfully in the absence of a compulsory license. He thinks not; I don't agree. I don't think the compulsory license was necessary. I think the compulsory license wouldn't have worked if it hadn't had the anti-trust exemption, and I think with the anti-trust exemption, it was totally unnecessary.

This approach is not for every situation, and the economics of the industry has to be known. The satellite owner situation that was raised this morning might be one area where it could work. I don't know enough about that industry. But if the compulsory license for cable is removed, maybe that's the place for an anti-trust exemption.

I suggest that that is an approach that should be considered more often in trying to deal with these problems.

Mr. **Goldstein**. Thank you. Our next speaker is Alexander Hoffman, Senior Vice President at Doubleday and Company. He earned his B.A. at Dartmouth and M.B.A. at the Amos Tuck School of Business. He has served with the U.S. Navy, and has been a member of the Executive Committee of Doubleday since 1969. He was director of the Association of American Publishers in 1969 to 1980, and in 1979 led AAP delegations to the U.S.S.R. and the People's Republic of China.

He is Chairman of the Board of Directors of the Direct Marketing Association and Chairman of the Board of the Copyright Clearance Center. He also serves on the International Freedom to Publish Committee of the Association of American Publishers.

Alex?

Mr. **Hoffman**. Thank you. I'll try to make this very brief and bring you good news. I think I can tell you of a concrete example of solving some of these problems. I'll speak to you from the perspective of my role as Chairman of the Board of the Copyright Clearance Center, but I must confess I inevitably speak also from the perspective of a book publisher, so you'll have to pardon that.

The Copyright Clearance Center is a collecting society, and a collecting society is the kind of entity that's been made necessary by the new technologies that make possible mass, uncontrolled reproduction of copyrighted works. There are twelve of these in the world now. The Copyright Clearance Center is the one in the United States. They all meet regularly, now twice a year, with the long term aim of establishing an internationally workable system for collecting and distributing royalties to authors and publishers. But I'll just deal with one example to try to show you how this works.

Now, you've heard it said that the new technologies make copyright obsolete, but fortunately, I really believe that is not true and it's very fortunate that it's not true since copyright really is the only workable means for a free society to foster broadly based creative effort. Rather, I believe the problem stems most often from uninformed attitudes and fears, and that these are solvable problems. In the few minutes I have available, I'm going to try to persuade you that this is true with one concrete example which embodies principles that I think are applicable in most other technological fields.

Now, the Copyright Clearance Center came into being at the request of Congress when they passed the new law which placed limits on systematic, multiple photocopying. They said this makes necessary the creation of a workable means to measure copying which goes beyond fair use and then to collect and distribute royalties for such copying. So they urged parties who were involved to work this out together. Systematic copying chiefly affects technical, scientific, and medical publishing at present, but let's not talk about the various kinds of material; let's just deal with the principles.

When Congress asked the parties to get together and work out a means to solve the problem, authors and publishers asked the library and academic communities to join with them in creating such a system. But apparently because the latter had come to view unrestricted photocopying as a birth right, or perhaps because they really believed it posed no economic harm to writing and publishing, they refused to do so. Nonetheless, the Copyright Clearance Center was created through the efforts of authors and publishers, and with the very valuable help of one renegade corporate librarian who apparently had an extremely active conscience. And, in a nutshell, the system that we set up orginally worked like this.

Publishers entered their titles into the system— as I said, this is mostly technical, scientific, and medical journals at the start—and they set fees for copying from these journals, and they print the notices in the publications. And the Copyright Clearance Center publishes periodically a catalog listing all the material.

User enter the system and use it by recording and reporting the copies they make. The Copyright Clearance Center then sends them a single bill. They send back a single payment. The Copyright Clearance Center distributes the money to those who have it coming.

Now, this system, unfortunately, had very limited acceptance, both because of the attitudes that I mentioned and because in the eyes of many users it required of them what they viewed as unacceptably burdensome record keeping. It was used mostly by about a handful, let's say ten to twelve, large corporations. Aside from that, this law has really been largely honored in the breach, as far as photocopying is concerned, raising the question that many of the Congressmen wrestle with constantly: do you leave a law on the books which appears to be unenforceable?

Well, let me go on and tell you that this problem has been solved, I think. After years of futile entreaties to bring about a cooperative effort to build a better system, if this one wasn't adequate, and to make it work to everyone's satifaction and benefit, publishers finally took the step they probably should have taken earlier, but were reluctant to take. They went to the courts.

The first actions were brought against four large corporations which were doing high volume unreported systematic copying, and these efforts were uniformly successful. But that's the dark side. It's too bad to have to do that kind of thing. It wastes money and creates bitterness, and it's bad all the way around.

Now comes the bright side of this tale. We said to ourselves, "Surely, now that these court cases have established that the law is enforceable, a cooperative effort to solve the problem should be possible since, presumably, *no* one should be interested in getting involved in a series of lawsuits with a predictable outcome." We tried a new tack. Instead of again approaching the corporate librarians, where we had really been faced with a stone wall from the beginning, we went to the chief executives of a number of large corporations and we said to them, "Sir, you run a business here that's based largely on your patents, so surely you can understand the philosophical concept of copyright." And they would say of course they do. And we'd say, "Well, now, are you aware of the obligations that your corportion has under the copyright law?" And most of them, I think quite honestly, would say, "Well, no, I hadn't really thought about it." So we'd explain it.

And usually, through this entree' we'd wind up talking to the chief corporate patent counsel, a man who would understand the concept of according to intellectual property the same rights you accord to material property, and we'd describe our existing system. Typically they would say, "Gosh, it's a big company. I can't imagine assuming responsibility for educating hundreds of thousands of employees to keep the records that your present system requires. We recognize the law. We would want to obey the law. We want to pay, but you don't have a more workable system?

So we'd say, "Well, what would you like?" They typically would say, "Well, we'd like to make a single lump sum payment for an annual license that would cover all the copying we do."

We said, "Fine. Let's both work together to see if there's a way to do that." And miraculously, several major corporations were willing to do that. After all these years of recriminations and useless fighting, once we were able to sit down with reasonable people and cooperatively try to figure out a way to do it, I think we've done it.

Briefly, it works like this. With the user's cooperation, we've developed a way to use sampling. We will go into an enterprise for a finite period of time, monitor all the copying that they do, on a title by title basis, and then we will project that to a longer period of time: a license term. Publishers enter their titles into the new system that same way as they did the old one, title by title, and they establish a copying price that's reasonable on a base plus per page basis. And then you simply multiply the projected copying volume times the publishers' prices, and you get the cost of the license. We've developed a computer system to handle all this efficiently, and it's on a title by title basis, so that the money can be distributed very accurately. Once the survey's done, the user needs to keep no records. He's licensed for all the copying that he does for the period of the license, which can be renewed periodically.

We haven't got the time to go into the details of how this system works, how we update these audits, and so forth and so on. Suffice it to say all of these are solvable problems and are being solved.

Also, in the longer run, we will be able to use mathematical modeling to greatly reduce the need for the periodic surveys, to cut the fuss down.

This kind of system appears to have been embraced as reasonable and workable and fair by the same people who, through misunderstandings, used to fight with each other. And I hope that the first license under this new system will be signed within the next couple of weeks.* This is very close to absolute reality.

How about the future? When copies are made electronically, recordkeeping and billing can be fully automated, but a collecting society, such as the Copyright Clearing Center, will still play its same service role as a single, efficient means to collect and distribute so that the user has just one place to deal with and doesn't have to go negotiate hundreds or thousands of separate license agreements. In fact, the automating will make it more accurate and might make it more simple; in this case, technological development will improve the situation rather than make it worse. And we will still preserve the economic underpinning of independent writing and publishing.

So I think there are two lessons that have been learned from this experience. One, the importance of education on attitudes, just as John was saying. If both sides understand and respect the principle involved, workable means can be found with a constructive joint effort.

And, secondly, since human beings are apparently almost infinitely resistant to change, it takes time. We must not be hasty to conclude that a carefully balanced law which was constructed over seemingly endless years of hearings and redrafting does not work or is unenforceable.

We may periodically need adjustments to deal with some new technologies, but by and large, I'm convinced we can make the law work and that our society will benefit from that effort.

Thanks.

Mr. GOLDSTEIN. Our next speaker is George Willoughby, Vice President for Corportate and Legal Affairs of King Broadcasting Company, a major television and communications corporation in Seattle. He graduated from Stanford Law School, and practiced law in Seattle for fifteen years before joining King. He is a member of the Seattle King County Bar Association and other bar associations.

George?

Mr. WILLOUGHBY. Thank you. I would like to make it clear at the outset that I'm here on behalf of a company that's involved in radio, television, and CATV. We are basically a user of creative product. In another sense, we're also creators, because we do create local programming. However I want to address my remarks as a user or a payor (or, as Jack said earlier, a victim, perhaps) of the system under which creative products of one entity are used by another. (We do not seriously believe we have been victimized, but the systems that have evolved may now be in need or review and change).

The other point is that we believe, as everyone else has expressed, that what is needed is a system for administering the use of and protecting the creative rights that will encourage use of the creative product without stifling and without infringing on anti-trust laws.

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*Company-wide licenses have been signed with the General Electric Co. and Warner-Lambert.

This morning, there were a couple of references to a possible model to be considered, which is the consent decree in the ASCAP/BMI music licensing situation. This governs the use of music by radio and television stations in this country. I want to address my remarks to this. I realize this is fairly narrow, but I think it is practical and important to consider the one existing model when trying to arrive at an administrative device which would allow for some kind of large scale protection of copyrights or creative products.

Particularly, we're talking about the ASCAP/BMI blanket music license and as you may know, this blanket license is fairly significant to television and radio. The television industry alone, for instance, pays in about one hundred million dollars a year to ASCAP and BMI under the blanket music license. It's been in existence for a fair amount of time. It came out of a consent decree in 1950. It's probably the only single, that I know of, really large scale, and in the past, reasonably effective type of procedure that is protecting and covering both the collection and the payment for creative rights, so it's a logical example to look at when trying to devise protections in other creative areas. However there are a few cautions to be kept in mind.

For one thing, it's a blanket license, and at least from a television industry standpoint, we're not certain that a blanket license of music rights is any longer needed for local television stations. I say this as a caution because if the ASCAP/BMI license is to be used as a model for other industries or other situations, the blanket characteristic needs to be examined closely. The question must be asked as to whether or not unlimited access to a whole broad class of creative product is a necessity—do users really need access to all the various forms of the creative product for which protection is being sought.

Back in the old days of television, when live orchestras were used extensively and there was a lot of spontaneous music use, the blanket license concept made a lot of sense. However, since that time, television has really changed. The industry is much more involved with pre-recorded programming, and therefore, the need to have a blanket license which makes two million or twenty million songs available, maybe doesn't exist. There is no longer spontaneous music use in television and the prerecorded programming is created sufficiently in advance that all necessary copyright rights could be cleared in advance as well.

The further problem with the existing television blanket license is that even if the rights to use music are obtained already from the composer, there is no meaningful carve out under the blanket license, so a double payment results. Any blanket license imposed in any other industry to protect creative rights, should have a realistic alternative built in so that users have a true choice. It's essential that if the ASCAP/BMI model is being considered, (and it has to be because it's the only method on a grand scale used so far that's really been effective) it must be kept in mind that there are ways in which it could be improved and altered to protect creators, as well as users.

Perhaps one way would be to establish a blanket license with the built-in alternative of direct per use licensing, which in all probability could be easily handled through existing computer technology. This would provide a choice to users, which based on the television industry experience in the music area, might provide a fair and workable protection for creative product.

Thank you.

Mr. **Goldstein**. Thank you very much, George. Our next and final speaker is Harlan James Cleveland, Director of the Hubert H. Humphrey Institute of Public Affairs, the University of Minnesota. Mr. Cleveland served as Executive Director of the Economic Section of the Allied Command in Rome from 1944 to '46, directed a channel office in Shanghai in 1947 through '48, and U.S. Ambassador to NATO in 1965 through 1969. He has taught at Syracuse University, at Princepton, and at the LBJ School of Public Affairs, at the University of Texas. He is a winner of numerous awards, including the Woodrow Wilson Award at Princeton. He has also written several books on international affairs, management, and ethics. I might add that, in the interest of keeping things as brief as possible, Mr. Cleveland has kindly put copies of two of his writings on the podium that you might want to pick up later on as you leave. I can recommend them to you. I read them last evening with considerable profit.

Mr. Cleveland?

Mr. **Cleveland**. Thanks very much. Your staying power is extraordinary. I expect it of the members of Congress, because they sit there all the time, listening to witnesses, but for the rest of us, I think it's admirable.

I had a call a few weeks ago from Hong Kong, from a young Chinese, a nephew of a friend of mine I worked with in China many years ago to tell me that he had just translated a book of mine and was going to market it on the mainland through one of the interested presses. And I thought that the next sentence was going to be, "Is that all right?" or "Who should I write to?" or something like that . . . [Laughter.]

Not at all. The next sentence was, "Would you please write the preface for the Chinese edition?"

So a few weekends ago, I sat down and wrote my first preface to a pirated edition. [Laughter.]

I'm not clear whether that makes me a pirate, or a co-pirate, or what. But it's some indication of the state, the near nervous breakdown, it seem to me, that the copyright laws are in. It seems to me that the trouble may be quite fundamental, and it's pretty late in the day or in the session to suggest anything quite so fundamental, perhaps, but it does seem to me that the notion that facts and ideas are owned is what's on the verge of a nervous breakdown. And if we can focus on what we're trying to do, compensation for creativity, or public access, broad dissemination—which is what the Constitution makers seemed to have had in mind—without tying it to the ownership idea, we might actually get somewhere.

It might be reassuring to note that in the puzzlement that's been evident the last couple of days over this subject that we've got lots of company, that we're in the midst of what I've been calling the great theory gap of the 1980's. Keynsian economics, we describe our whole era with references to where we've just been, post-Keynsian, post-industrial, post-New Deal, and so forth, which means that we don't really know how to describe what we're in. We've got inflation and recession glued together in a possibly non-cyclical fashion, and the economists don't know what to do about that. The military strategists don't know what to do with a—now that we've developed the ultimately unuseable weapon. The management theorists are only gradually accommodating to the fact that most of the world's work gets done by what the Japanese call consensus and the communists call collective leadership and we call committee work. [Laughter.]

And the law, trying to catch up with the fast break called information technology, this explosive convergence of computers and telecommunications that's been converging since the 1950's but that converged for real in the early 1980's.

The trouble, I think, was suggested by something that Judge Breyer said when he warned us against making policy by analogy. We have carried over into our thinking, it seems to me, a thinking about information which is just a symbol, concepts that worked okay for the management of things. But now the manufacture and the mining and the farming of things—is now rather less than one quarter of our economy whether you measure it by GNP or by labor force. So we are the primary resource, the key resource in our business economy, Peter Drucker calls it, is information. It's a peculiar resource. It isn't depletive, necessarily. It's often expandable. It grows with use. It's not scarce. Harvey Branscombe, of IBM, speaks of the "chronic surplus of information." It's sharable. It doesn't give rise to exchange transactions, as such. The service may be an exchange transaction, the service of delivering it, but not the information itself. And it's diffusive; that is to say, it leaks. It has an inherent tendency to leak, unlike things. As the CIA keeps finding out.

Now, the new technologies, which produce new kinds of works, software, new techniques of piracy, Xerox, videotape, the back yard dish; new means of delivery, microfiche, computerized data bases, and so on; is producing what I call in one of those articles a whole lot of Canutes in our society. That is, people who remind you of old King Canute, who stood on the beach and told the tides to stand still and then got wet. It's a bum rap, actually. The Viking historians, not the historians of the football team, but the historians of the Vikings, say that what he was really trying to do was to convince his stupid courtiers that he wasn't all powerful and therefore he was going to put on this demonstration, which was successful, in that he got wet. But his name has gone down in history as a metaphor for people who try to prevent the inevitable.

And I have, in recent years, been giving out the King Canute prize. In 1981, it was easily won by Alexander Haig for saying "I'm in control here." [Laughter.]

It was interesting, the reaction of the American people. We were neither reassured nor were we angry. We laughed, nervously——[Laughter.]—as in watching a theater of the absurd. [Laughter.]

For 1982, it was quite difficult because there were so many candidates. There was the Association of American Publishers——[Laughter.]

Or the NYU case, and there was HBO, trying to chase around, preventing people from putting up the backyard dishes, and there was CBS which already was an earlier case, but they tried to prevent Vanderbilt University Library from lending out copies of CBS News, but the Senator from Tennessee took (unintelligible) special law on the subject. And there was Universal City Studios versus Sony, so we finally gave the prize to the Ninth Circuit for hitching their wagon to what Congress meant to say about technologies that it couldn't yet imagine. The Supreme Court proved by what, to me, was a surprisingly narrow majority, that horse sense is not necessarily incompatible with the law. At least, not in that case.

The problem, then, may be the very comcept of information as property, just as in the accounting field, the accountants and the tax writers in Congress, for that matter, are going to have to take a new look at the concept of depreciation in an economy that's three-quarters, or maybe half, information work. It's a great bonanza; that's why the information companies are making so much money, I guess it's partly that they're able to pay the depreciation when they're not incurring it. I mean, they're able to deduct it without incurring it. But still, it requires a rethink. And, similarly, I think, in this case it requires a rethink.

It can be retarded, this nervous breakdown, by some technological fixes, and we've heard about a number of them these last two days. Scrambling signals, and that, codes of various sorts, in software, although the teenage computer hackers seem to be equal to almost everything that has been invented so far.

But the leakiness of the information resource seems to destined to overwhelm Canutish efforts to imprison it. The history of arms control and the recent efforts of the computer pirates teach us that there always seems to be a technological fix for a technological fix.

But we've really abandoned already, haven't we, the idea that intellectual creativity has to be rewarded with ownership. That's really a minority of what's going on these days. Most U.S. patents are held by organizations, corporations, universities, government agencies, not by the inventor. And many copyrights are held by publishers and promoters, not by the authors and songwriters the founding fathers probably had in mind when they sewed that provision into the Constitution.

In universities, creative work is rewarded mostly by promotion, tenure, and tolerant attitudes toward minimal teaching loads and outside consulting. As result, we generate quite an innovative research and development effort in this country without most of the scientists and technologists involving having to own the ideas they contribute. Some leaders of industries on the high tech front here are already saying that their protection from overseas copyists doesn't lie in trade secrets, but in healthy R&D budgets. John Rollwagon in Minneapolis, the Chief Executive of Cray Research, which produces the world's fastest computer, puts it this way: "By the time the Japanese have figured out how to build a Cray I, we have to be well along with designing Cray II, or we're out of business." And that's what's made this country run along, isn't it? Always doing something that had never been done before. Not just rescuing the things that used to be done well.

So a notion of information as property is built deep into our country's laws, into our economy, and into our political psyche. But we must continue to develop, it seems to me, better ways of rewarding intellectual labor without depending on laws and prohibitions that it seems to me are visibly disintegrating before our eyes very much as the 18th Amendment did in our earlier efforts to enforce an unenforceable prohibition.

Thank you.

Mr. GOLDSTEIN. Thank you, Mr. Cleveland. In the interest of getting you out of here on time, I'd like to make a couple of proposals. One is that we take questions until 6:45 from members of Congress and staff first, of course; and second, following that, that we move directly into the summation by the Rapporteur. There will not be much of a transition there; I'll just quickly change hats.

So, if we could start with questions. I take it that indicates the hour rather than a lack of provocative points raised. Mike?

Mr. REMINGTON. Mike Remington, House Judiciary Committee. I have a question for Mr. Cleveland. Traditional copyright has criminal penalties. It is treated as property. We've seen, as you suggested in your statement, that some of the new technologies are transitory, they're microscopic in size, and so forth. My question is the following: how equipped are our governmental institutions, prosecutors and courts, to treat copyright in the context of the criminal laws.

Mr. CLEVELAND. Well, it seems to me that the courts are already trying to do far too much and with all this talk about alternative dispute settlement and so on, the notion of loading on the courts a whole new generation of cases, you know, a thousand Betamax type cases on various technologies, is just appalling. They can't handle the business they've already got, and we're doing probably a worse job in criminal justice than any other industrial country today.

So it seems to me that we simply have to work out intermediate systems, and I think some of the discussions about the Copyright Center and the ASCAP formula and so on are interesting ways of getting at an intermediate formula.

It seems to me that the vast majority of this kind of business, of making sure that the creators are compensated for creation, which is an important objective, treating information as property isn't, but compensating the creators is, that we just have to look for those intermediate formulas.

And I would opt for every possible formula that would keep all but the occasional sort of policy setting case out of the courts entirely.

Mr. GOLDSTEIN. I think John Taylor would like to respond to that question as well. Oh, you didn't?

Mr. TAYLOR. I wanted to ask a question (inaudible).

Mr. GOLDSTEIN. Okay, we'll let's hold on to that then, for a moment. Yes, sir?

Mr. FISH. Ham Fish. Mr. Cleveland, just a point of clarification. You were challenging the concept of information as property, and do I interpret you correctly that you're talking about assembled information and not original books or authors or artistic works?

Mr. CLEVELAND. I think you could probably make a distinction between, say, a poem or a piece of music or a romantic novel and the other 99 and a half percent of the knowledge industry, which is everything else we do, and everything that everybody in this room, after all, are information workers.

And it may be that that is the way to go on maintaining the very narrow construction of the Constitutional mandate, which is there, after all, but working out a different system that doesn't require us to contort ourselves to think of all the other kinds of knowledge and information that are crowded on our desks as belonging to somebody. I mean, to me, the notion of owning an idea or even owning a fact is, you know, very hard to grapple with, intellectually. And much of what is talked about as being owned and protected is really, as was said by several other people, is really assembly work and not—like the data bases—and not the original--not creativity in the Constitutional sense.

Mr. GOLDSTEIN. All right, thank you. If there are no other questions from members of Congress or staff, I know that Mr. Cleveland's remarks prompted—are going to prompt—some questions both from Bud Taylor and from Alex Hoffman. Bud?

Mr. TAYLOR. Well, actually, I'll respond to that question because what I was going to say fits closely enough where I can fit it into that mode.

I think that Mr. Cleveland has begged the issue right way when he talks about ownership of information. Copyright has never attempted to protect or give exclusive rights to facts or information, and anybody who's ever practiced in the copyright field is always facing that problem. And when you get a work which is the packaging of facts and information, it has always created difficult problems in copyright.

They typical example is a biography. If somebody writes a biography and then somebody else does another biography, how close do they have to be and how much do they have to appropriate before they're infringing that copyright or just making fair, legitimate, unprotected use of the facts that were in that biography.

What is creating the problem today with the growth of computer technology, the accessing and the accumulation of data and facts has become so important and has become so expensive to create that it's beginning to get the two areas all mixed up together, and I agree with Mr. Cleveland, I think that you can't deal with data banks and that kind of fact accumulation within the traditional sphere of copyright. But, because you can't deal with that, let's not destroy or do away with a copyright system that protects artistic works and original thought and the creation of new ideas which has worked so well for so many years.

Mr. GOLDSTEIN. Alex, I think you had——

Mr. HOFFMAN. Saved me from saying that, and to repeat, we're trying to protect original creativity. Nobody has ever talked of ownership of facts and ideas. That's an absurdity. Of course you don't own facts and ideas, you own—what you're trying to protect is the ability to create unique expressions in whatever medium, and you talk about the Association of American Publishers winning your Canute Award——

(Simultaneous discussion—unintelligible.)

Mr. HOFFMAN. This is very important. [Laughter.]

Okay, runner-up. Is that this gets at the very point of what is the concept of copyright. Now, what was involved in the NYU case? Publishers had sat around for years, trying to avoid doing this—taking this action, because it's very distasteful. What was the action? The exhibits in that case were 43 homemade anthologies, where a professor would go into a copy shop and say "I've got 60 students in Sociology 12. I want you to make 60 sets of this material. I want you to copy two chapters from this book, three chapters from this book, one chapter from this book, these articles. I want you to bind them. I want 60 sets, and I'm going to sell them to the students, say, for $35.00 or $40.00." All of this without permission; all of this without payment.

Over the years, we have published lots of anthologies. We can't do that very much any more, because they are all stolen. That's pretty important.

Now, that case was so open and shut that it didn't go to trial, finally. That is simple, pure, stealing. And it will undermine the economic underpinning of a whole category of publishing if it isn't stopped. You may call that Canute, but God help us if that sort of thing is accepted behavior. Because a whole lot of writing and publishing is going to go away.

Mr. Goldstein. I think we have time for a response from Mr. Cleveland and then just one last question. I noticed that Deborah Leavy had——

Mr. Cleveland. My point, essentially, is not—I'm not trying to make a moral point or even an economic one. I'm just trying to make the point that if a rule is unenforceable, then trying to pretend we're enforcing it is bad news for governors. And I think that this rule has, for most cases—this may not be true of the poem, for example—but for most cases, it seems to me that this rule is unenforceable and that simply to try to make a more and more complicated piece of legislation require more and more recourse to the courts about something that is going to be widely honored in the breach anyway, is the way to give disrespect to the law.

Because one other angle of copyright that hasn't been mentioned at all since yesterday afternoon, at least, when I got here, and that is the right of the author to have his material be considered with integrity. My right not to have somebody reprint, taking out all the best paragraphs, for example. And I think that's even more unenforceable in any court sense, but has a moral position which I think is perhaps more sustainable than the compensation part.

Mr. Goldstein. I think Deborah Leavy had a question.

Ms. Leavy. Yes, I did. Chris Burns put a slide up this morning, showing at the top of the slide an abstract that had been prepared at some expense, saying that through dissemination, the information had lost a great deal of its commercial value. I think that we've seen that information has a commercial value as property, whether it's the facts that have the value or the presentation of the facts. That comes into conflict with the First Amendment value of access to information. When it is a newspaper that publishes the information in that abstract, and is then considered to have devalued that information, I think that that's where we start to get into problems. That's where I see the tension coming, because information has commercial value.

I'd like someone to comment on that. Dr. Cleveland (inaudible).

Dr. Cleveland. I read his chart rather differently. It seemed to me that he was showing the way information turns up in all sorts of differents forms, the total of which is more valuable than it was when it got started. I mean, that's what the whole advertising agency, that's what the government propaganda industry is doing, that's what public relations industry is doing. They're enhancing the value of the word by spreading the word, and that's what the economics profession is having such a time with these days, because they don't know how to price information because they've all been brought up in the same economics courses that I took that economics is the science of the allocation of scarcity. And when you get to the allocation of abundance, they don't know how to deal with it, and that's one of the—that's got to be one of the new breakthroughs in economic thinking.

Ms. Leavy. Well, if I could just follow up. It seemed to me that when Chris Burns put that slide up, he said that the end result, after all this information had been widely disseminated, would be that the company that had published the abstract originally, or issued the study, would try and keep it more secret next time—that's the reason I had drawn that conclusion, and I guess my question really is, will restrictions on dissemination of information increase or decrease creativity, since it's all a process of feeding off, one off the other. That's a First Amendment value problem.

Mr. Cleveland. It goes beyond the First Amendment, though. It's really the value of dissemination of information which is one of the main motivations for the constitutional provision on the authors, has a social value in itself. And even if the company that started the chain finds that it can't make as much out of the information when it's spread all round, the total social value of that information having been spread around seems to me to have greater, and from Congress's point of view, that's the side of the fence that they have to try to protect.

Mr. **Goldstein**. I'm going to exercise my moderator's prerogative and be slightly immoderate and close off questions at this point in the interest of time. I'd like to thank our panel very much for providing——[Applause.]

You're certainly welcome to stay here. I shall not be too long.

Let me quickly shift hats from moderator to Rapporteur.

In my role as Rapporteur, I have been asked to synthesize this weekend's proceedings, and to try to distill the important lessons learned. Although, obviously, I cannot reflect everything important that has been said here, I believe that I can, at the very least, describe three central themes that have pervaded this Symposium and that have variously been touched on in the remarks of the speakers, in questions from the participants, and even in some of the technology exhibits. In the spirit of this symposium—which is to take a highly objective, policy-oriented look at copyright and the new technologies—I shall express these three themes not in terms of solutions, but rather in terms of options; not in terms of answers, but rather in terms of questions.

Haines Gaffner accurately capsulized the first two of these themes in his reference to the two polar concerns of policymakers in this area: software on the one hand, and transmission and access on the other.

Software. Should computer software, and allied subject matter, be protected by copyright? This simple question leads to some deeper issues: Do we need more investment in the production of computer software? If so, will copyright protection induce the correct level and direction of investment in software production? Will some other intellectual property be more efficient? More equitable? The importance of these questions is amplified by yesterday's demonstration of Control Data Corporation's PLATO library—a library that, according to Jean Harris' presentation yesterday, consumed a one billion-dollar investment.

Transmission and access. The questions here concern rights and infringement, not only of new copyright subject matter, but also of more traditional copyright subject matter. To what extent should copyright subject matter be protected against new uses facilitated by computers and other new technologies? Note that it is characteristic of these uses that they will often be decentralized and undetectable. The problems created by such new uses were exemplified by at least two of yesterday's exhibits—the demonstration of home satellite antenna reception, and of the disencryption of Visicorp's programs by a competitor's program, named—with true gallows humor—"Copywrite."

I.

Should copyright protect computer software? The discussions this weekend have reduced this question into three sets of subsidiary questions:

A. Are market conditions in this field such that producers need some form of protection, or subsidy, to stimulate the desired level of investment? Jean Harris' figure—one billion dollars to assemble the PLATO library of programs—certainly suggests some form of protection is needed to enable investors in the position of CDC to recoup their investment, or that some form of direct subsidy—from government or private foundations—is needed to serve in place of private investment. It is suggestive, certainly, but not necessarily conclusive.

B. If it is concluded that producers do need protection, should that protection take the form of property rights, or will technical self-help—program encryption, for example—be more cost-effective? Martin Greenberger noted last evening that WORDSTAR—one of the most widely used programs—achieved its commercial success without resort to encryption. Further, the Visicorp example suggests the limits to self-help through encryption. And, even if encryption is found necessary to protect investment, and even if it did work effectively, we might ask whether we want to encourage the development of forces that will devote fine minds, and much valuable time, to the production, and destruction, of ever more elaborate encryption safeguards—minds that might more productively be applied to the development of new, positive programs instead.

C. If all of this suggests that legal protection is desirable, what form should that legal protection take? Is copyright the appropriate vehicle for protecting software? Copyright law's traditional design has evolved over centuries to meet quite different needs, and may not be appropriate to this subject matter. Copyright might, for example, offer more protection than is needed in some respects, and less than is needed, in others. Register of Copyrights, David Ladd, addressing a closely analogous issue, observed yesterday that, assuming some kind of protection is desirable, it may be necessary to look outside copyright when dealing with data bases. Do the costs and benefits of (i) taking the copyright route net out to be more or less favorable than the cost and benefits of (ii) adapting some other, existing intellectual property system to the protection of software, or (iii) adopting some entirely new system specifically designed to protect software? Earlier today, Congressman Smith raised some questions that pointed in this direction—asking whether it might make sense to break copyright down into more discrete subject matter-oriented vehicles.

Let me turn to the second theme touched on in these proceedings—transmission, access, consumers, and the administration of rights in both traditional and new copyright subject matter. What have we learned here?

One thing we've learned is a new word: downloading. From the examples given, though, I think we have also learned that this word is just a new way of describing an old and central quandary in copyright law: What uses of copyrighted works should be proscribed and what uses should be permitted? Although some of yesterday's speakers expressed the assumption that copyright law protects only against the production of a work in tangible copies, the truth is that copyright has, for well over a century now, also protected against a wide range of nontangible uses, such as often occur in downloading: performance, distribution and, more recently, under the 1976 Act, display of copyrighted works.

Although this might seem a minor quibble over words, I believe that it illustrates a larger problem in the legislative process: the risk of being distracted by new jargon and the risk of thinking that these new terms express new phenomena that need to be treated on new principles. The larger, connected danger is that of false analogies. As Judge Breyer noted earlier today, the analogy that grips Congress' attention will be the one that controls it.

Put in this frame, the question of liability for downloading does, however, helpfully exemplify the main challenge that the new technologies pose to the administration of copyright: should we extend rights against uses, facilitated by new technologies, that are widely dispersed, decentralized and frequently undetectable—not only downloading, but also library or office photocopying and home videotaping and audiotaping. How do we manage copyright in a world in which everyone is his or her own publisher or producer, truncating the traditional patterns of distribution?

In an ideal system of property rights, painted by some participants in this Symposium, everyone who uses a copyrighted work will pay something for this use—be it an amount that reflects the information's cost to the producer, or its value to the user. Yet, from the very start, copyright law made no pretense that this ideal was attainable, efficiently or equitably. From the beginning it was assumed that many uses of copyrighted works would go uncompensated. The married woman who bought a copy of "Uncle Tom's Cabin" and, after reading it herself, shared it with her family and then with her friends, paid neither more nor less for this widely-used copy than the lonely bachelor who bought a copy and only read it himself.

What has changed is that the new technologies have dramatically escalated the degree to which copyright uses today may go undetected and uncompensated. Now that the new technologies have disabled market transactions in many contexts, the question arises whether these new uses should be free, or whether the basis should be laid for new forms of market transactions.

The question whether new rights should be created has quickly been overshadowed in our discussion by the question: How can the transaction costs of policing copyright uses be reduced to acceptable levels? Don Devine has referred to such relatively low-cost and non-intrusive compensatory schemes as volume discounts to major centralized users. Another suggestion was dual pricing under which libraries and other centralized users would pay one—presumably higher—price while individual users paid a lower price for the same work. Another possibility, noted by Mel Harris, is simply self-policing among individual users.

Should new institutions be erected to police new rights? One caution, pointed out by more than one Congressman at this Symposium, is that we must be careful to avoid enacting laws that cannot be enforced, for the result will be disrespect for the law generally. A closely related point is that we must do what we can to educate the public as to the purposes of copyright law, generally.

If new laws and institutions should be created, should they be aimed at simulating market results or should they be aimed at some other object? Should they be run by government agencies, of the sort described by Chairman Brennan of the Copyright Royalty Tribunal, or by private organizations, like ASCAP and BMI, as described by John Taylor and John Kernochan? Or should they follow the pattern of the Copyright Clearance Center, as described by Alexander Hoffman? And, if these institutions are to operate in the private sector, should they be regulated by antitrust decree or otherwise?

There also has been some suggestion that the problems that the new technologies have created, by proliferating decentralized uses, should not be allowed to obscure the potential ways in which these very same technologies—as data storage, computation and retrieval—can in fact be employed to enable every user to pay for what he or she uses, by maintaining, recording and calculating each use, be it photocopying, or borrowing from a library—or downloading, for that matter. Needless to say, though, the concern for protection of individual privacy, as expressed by Mr. Berman, is implicated here.

Although the problem of decentralized uses has occupied center stage in the discussion of rights—in the Congress, in judicial decisions, in public policy debates, and in our own discussions, too—I should note another aspect of the administration of rights that was considered in this Symposium and that was well underscored by the remarks of Joseph Lash, John Taylor and John Kernochan: What are the implications of these new, technologically facilitated uses for the returns paid directly to the authors, composers, and artists who make the copyright engine run? In what ways can new technologies be harnessed to achieve the more equitable distribution of royalties to the creators of copyrighted works? Parenthetically, Joseph Lash's example of his photocopying activities in Columbia University's Russian collection should remind us that the questions of use and production are closely connected in copyright: To produce knowledge requires using information created by others. This knowledge, once produced—and copyrighted—will in turn become a source of information for still others in their production of knowledge, and so on, in what is hoped to be a never-ending chain.

III.

Finally, I would like to touch on a third theme that, although not expressly addressed in these proceedings, underlies all that has been said and, indeed, represents the very reason for our being here: How can the House and Senate Subcommittees charged with responsibility in this area, and how can the Congress generally, best position themselves to monitor the new technologies and to adjust copyright, and possibly other intellectual properties, to maintain the needed balance between incentives to the production and consumption of new information?

If any one point has been made clear these past two days, it is that technology is advancing at a pace far greater than the capabilities of the national legislature to keep up with it. Congressman Kastenmeier poignantly reminded us in his introductory remarks that Congress, in passing the 1976 Copyright Act, perceived the need to temporize on some emerging, already problematic, technological issues in order to achieve final resolution of issues that had long been pressing for remedy. I was struck in this connection by Haines Gaffner's bromide respecting the new technologies: "When you are working on the cutting edge of technology, the main thing is to stay behind the blade." That applies at least doubly for Congressional efforts: "When you are legislating on the cutting edge of technology, the all-important thing is to stay behind the blade."

I say, "it applies doubly," because there are variables other than technology and the legislative process that are implicated here. Let me just identify four.

A. One is the crucial issue of timing. Earlier today, Senator Mathias noted the ever-present danger that, even while Congress is deliberating on these important issues, changing economic realities may very well entrench the new technologies, thus concluding the issue being deliberated, and precluding a principled result. Don Devine pointed out that personal computers will experience their greatest growth in the next decade—a far shorter horizon, no doubt, than Congress can possibly contemplate in dealing with that growth.

B. Second is the problem that economists refer to as distributional effects, and that Dr. Spurlin more graphically described as the possibility that public policy decisions in matters involving the new technologies can very well widen the gap between the haves and the have-nots—or, as Clyde Washburn indicated, between rural and urban users—in terms of access to vital information technologies.

C. Frederick Weingartern alluded to the great intellectual tradition of sharing ideas that characterized the efforts of early developer as in this field, and that characterizes first-rate scientific research generally. Will existing or new intellectual property laws erect barriers to otherwise collegial communication? Care must be taken to attend to these possible effects which can only impede technological advance over the long run.

D. Fourth is the international setting. This naturally raises the question of the extent to which steps to encourage software production will affect our national balance of trade. Related to this is the question of piracy on an international scale as developed by Harvey Zuckman's questions to the panel he moderated earlier today. There is also the question of our ongoing obligations under international copyright treaties. In this last connection, I might note that while it might seem efficient to break copyright into separate laws, each dealing with a discrete form of subject matter, this method, to the extent it produces substantive gaps between our law and the laws in force elsewhere in the international copyright community, may put us in default of our obligations under the Universal Copyright Convention and effectively bar us from ever joining the more rigorous Berne Convention.

What institutions can Congress employ and encourage to engage in the needed, systematic monitoring and oversight?

1. More meetings such as this would certainly be productive; but they are also incredibly taxing, and I don't know how frequently the members of Congress—occupied with so many other concerns—will find themselves able to pay that tax.

2. The hearing process is certainly another possibility. I would remind you that Macaulay's seminal statement on copyright, already alluded to by Judge Breyer and Professor Kernochan, was made on the floor of another great deliberative body—the House of Commons. The broad-ranging hearings conducted by Congressman Kastenmeier's Subcommittee this past July, on copyright and the new technologies, is certainly a more immediate example.

3. The governmental commission is another possibility. CONTU—the Commission on New Technological Uses of Copyrighted Works—created by the 1976 Act, provided some helpful guidance in the area. Senator Mathias' bill, S. 2192, to establish a Commission to Study the Concept of the Public Lending Right also points in this direction.

4. Perhaps, too, there is a need to look outside Congress—to some independent facility, possibly unversity-based, funded through foundations or supported through some other means—to provide the Congress with systematic advice on these important issues of public policy.

I do not mean to suggest by any of this that the task of designing such an institution for oversight and reporting will be easy or quick. I only mean to suggest that, if I read the evidence presented at this weekend's proceedings correctly, the task is an important, and possibly a necessary, one.

Thank you very much. [Applause.]

Mr. Leibowitz. Thank you, Professor.

I just want to remind you that we have a reception beginning in just fifteen short minutes, and then the dinner to follow at 8:15, where we will have Frederick Pohl as a very illuminating guest speaker.

This concludes the second day of this symposium in terms of the panel discussions.

Mr. Keplinger. Good evening, ladies and gentlemen. We're here again for another evening following a very, very heavy day, and I hope that everyone has had a chance to enjoy their dinner and get started on the dessert.

We're privileged this evening to have with us one of the great writers of the science fiction world. I feel uniquely privileged to be able to make this introduction for our speaker this evening, as someone who reads every science fiction book which comes out. There are about five authors that I think are really the great ones in the field—we are privileged to have Frederik Pohl as our speaker this evening, a science fiction writer who has won virtually every award that a science fiction writer can achieve.

DINNER SPEECH

INTRODUCTION OF SPEAKER

TRENDS, DEVELOPMENTS, AND PROJECTIONS

His achievements lie not only in the second part of that term, "fiction," but in the first part. He's been recognized by the American Association for the Advancement of Science for the accuracy of the predictions that he's made concerning the science in his science fiction stories, and he's graciously agreed to speak with us this evening and to share some of his ideas about the future with us, and what may be happening.

It gives me great pleasure to introduce Mr. Frederick Pohl. Thank you. [Applause.]

Mr. Pohl. A couple of times in my life, I've had the experience of being on a panel in an afternoon and then giving a talk in the evening, and sometimes getting so carried away with the sound of my own words on the panel that I blew my whole talk for the evening. Today, I had a somewhat different experience. There were three other panels that seriously worried me, because they were touching on the subjects, or at least some of the subjects, I wanted to talk about. So, those of you who don't like longwinded speeches will be happy to know that this is now four pages less than it started out to be, because you heard part of it in the panels today.

I asked Mike Keplinger to mention the Triple A-S and the Encyclopedia Britannica when he introduced me. That's a ploy to entice you into believing some of the things I say, because for some reason or other, science fiction writers are not universally regarded as wholly authoritative all the time.

On the other hand, you've heard an awful lot of really authoritative people today, telling you all the copyright aspects of high tech media, about the production of software, not to mention the ever-popular "downloading," which I used to think was called "free-loading"——[Laughter.]—in all of their manifestations. So I assume that you all know all about all of these subjects already. Anyway, if there's anything you still have to learn, you're not going to learn it from me. I have neither competence nor incentive to add to your knowledge or your confusion in these respects.

What I would like to do is to discuss the question of copyright from a somewhat different point of view; that is to say, from the point of view of the raw materials end of the production and copyright consumption chain: The person to protect whom the copyright laws were first devised, because I'm one of these people: I'm a writer. My excuse for standing before you tonight is that if it were not for us writers and others like us—the composers and the artists and so on—there just would be no reason for this conference, or for copyright in the first place.

Before I came here, I read a paper by our host, David Ladd, Register of Copyrights, which had some flattering things to say about us raw materials producers, particularly a quote from Count Alex deTocqueville, who said, "From the time when the exercise of the intellect became a source of strength and wealth, we see that every addition to science, every fresh truth, every new idea, became a germ of power placed within the reach of the people." And Mr. Ladd goes on, "It is to provide the resources to reward and thus sustain and motivate authors," and I presume other people who create things, "that is the central idea of copyright."

Now, as a writer, I think that emphasis is very well placed. In fact, I might go even farther. You see, from the writer's point of view one sees, the entire mechanism of publication and copyright, distribution and vending books, in a quite different way than from the point of a view of a librarian or a journal editor. My job as a writer is to put words on paper. The reason I do that is so they can be read by, hopefully, some millions of people who want to read them, most of whom I will never meet, many of them in countries I will never visit.

Now, although I am a writer, I am not wholly lost to reason. I know that there are many people who will have to be involved in getting my words to the reader in Tulsa or Edinburgh or Tokyo, who wants to read it. I spent a lot of time over the last forty-odd years, working as an editor, a literary agent, copywriter, specializing in book advertising, assistant circulation director of a couple of large magazines, and so on, and so I am aware that there is an enormous superstructure of publishers and editors and proofreaders and promotion departments and salesmen, warehouses, libraries, retrieval systems, and all sorts of other people and processes involved. But from my point of view, these are what I describe as the software, which I maintain at great expense to myself, just to get my words from me to the people who want to read them.

I suppose that if I were a hog in the Omaha stockyards, looking across the street to the slaughterhouse, I might feel about the same way. I could convince myself that all those farm hands and veterinarians and butchers and sausage makers were just my personal servants [laughter] having no purpose in life except to see that my juicy chops were served up on somebody's table. [Laughter.]

Fortunately for me, that process is a lot less painful for a writer than for a hog, or at least somewhat less terminal. [Laughter.]

On the other hand, the act of getting ready to be published—or, in the case of the hog, slaughtered—is easier for the hog than for the human. All the hog has to do is eat. The writer has a harder job, and I would like to explain some of the technical aspects of it with, as my scientific friends say, the numbers in.

The method of generating a novel is very simple. If you want to write one, all you need to do is get hold of some paper and a typewriter or a word processor or a pencil—well, several pencils. If what you wind up with is a typewriter, say, the sort of Selectric II that I've been using, you will see when you sit down at it that it has 57 keys staring up at you. All you have to do is hit one or another of those keys, one after another, half a million times.

Now, that's not hard if you're a fast typist. You can probably do it in a forty-hour week. [Laughter.]

The trick is that you have to hit them in the right order. [Laughter.]

And that means that you have a lot of individual decisions to make. In an average 60-character line, about 3,200 choices to pick among, and you have to do that for your novel about 12,000 times.

It isn't really as hard as it sounds, or not quite as hard, but making decisions is the hard work of writing. It is why writers who sit at their typewriters for an hour and more manage sometimes not to produce a single word, because they can't make up their mind what that word should be.

I try to write four pages a day, and a couple of months ago, I set an entire record for myself that I hope never to surpass, trying to do those four pages, I sat there for ten hours, and at the end of the tenth hour, I had not only finished a page or even a word, I had typed one letter. That was very painful.

However, the decisions about which character, which key to press, don't have to be made as laboriously as the numbers might suggest, probably because some of the key combinations are meaningless; mostly because a lot of that decision making is done at a subconscious level. When I'm writing, I don't think about keystrokes, I think of words and sentences, and my fingers know what to do.

Of course, the reason my fingers are so smart is that the exigencies of my profession have forced me to become a pretty fair typist—sloppy, but quick. If you happen to operate by the hunt and peck system, then you do have to make all those 40 million separate decisions. At present you do, at least, but relief may be just over the horizon. Computers are getting smarter all the time. Perhaps one day soon you will be able to buy a smart computer program, to substitute for the smart fingers you don't have, and so become an instant master typewriter operator. You can already buy word processor programs that contain a dictionary. This file will convert you into a mediocre speller, providing you have begun as an absolutely abominable one.

The program, unfortunately, takes no notice of context, so if you misspelling converts the word you want into another real word that isn't what you want, the machine won't challenge it.

There are non-technological solutions to this problem for many writers. Traditionally what they do is marry somebody who can spell. [Laughter.]

Some find the word processors cheaper in the long run. [Laughter.]

And there are other ways of eliminating a lot of those decisions through the kinds of creation that are called stochastic or aleatory; respectively, random art or found art.

Years ago, I shared an office with a stochastic artist. He did his work with his brush and a comb. First he'd tack up his canvas on the wall, then he dipped a toothbrush in some paint and he'd pull it back or put a comb across it, and it would splash on the canvas, sometimes on knees, sometimes on my manuscript . . . [Laughter.]

And the result was stochastic painting, constrained by the facts that he chose the colors and aimed at more or less where he hoped it would go; random in that he couldn't really control the individual droplets. He got some pretty effects on his canvases, and now and then, he actually had some hung and people bought them. And he was only doing, in a primitive way, what a whole generation of video artists are doing in more high tech and complicated ways today.

Around the same time, I used to play poker with a bashful young fellow named John Cage, who is today perhaps the world's best known practitioner of the aleatory school of music composition. Cage takes music where he finds it. One of his—I don't know if compositions is the right word—one of his performances takes place on a stage with ten radios on tables across the stage. Each one has a man, who possibly could be called a musician, standing by it, and each radio is tuned to a different station. And the performance involved each of these people turning the volume on his station up at more or less at random, to volumes that they like.

This is not the sort of art that most people enjoy, but it is interesting. And there are several reasons why I'm glad I am me instead of the Register of Copyrights, and one is that I would not like to face the problem of whether John Cage's compositions are copyrightable or not. For that matter, I'm not too sure that some of the compositions that most of us regard as pure music are wholly copyrightable because quite a few of them contain found themes—such as Tschaikovsky's 1812 Overture and so on.

Our writers don't make much use of aleatory composition because we sort of frown on it and call it plagiarism. Stochastic composition does exist. William Burroughs is supposed to have written one of his novels by typing it all out and then slicing it in half and pasting the lines back at random. I don't know any other writers who do that, although I know some whose work looks like it. [Laughter.]

But other stochastic processes have been used for a long time in the days of the pulp magazines. When I began writing, you could buy a thing called Plotto, which was a deck of cards. You'd deal yourself out a story. The first one would tell you the name of the hero, name of the heroine, and so on. Look at a different part of the card, and it'd tell you the color of their hair, what they do for a living—electrical engineers or highwaymen or garbage collectors or Congressional aides, or . . . [Laughter.]

. . . various things, and if you just dealt them all out, you would sooner or later have a story. Not a good story, but you'd have a story.

Of course, that sort of data store is easy to work into a word processing system. If you add to the stochastic function of generating random plot elements one of picking up appropriate sentences and paragraphs to embody them in, you have machine to write short stories. And such programs do exist, although in a very rudimentary level. I have seen those machine-generated stories and machine-generated poems.

They're not very good, on the average; but on the average, most stories by human beings are not very good, and the computer hasn't been practicing as long.

There's actually a fairly easy program to write a stochastic, or random, poem. It's so easy that you don't need a computer to do it. All you have to do is next time you have time on your hands when you're in an airplane, hovering over LaGuardia or O'Hare, or in Miami, and have nothing left to read except the airline magazine which you've already looked at and somebody has torn the best pages out of it anyhow, what you do is select an article. You write down the first word in the article. Then you look through it until you find that word again, and you write the word next to it. Look through till you find that second word, and repeat the process until you have what you are able to convince yourself is a poem.

Now, here's an example of one I did last week between LaGuardia and Detroit— [Laughter.]

—using a book of short stories published by a friend of mine. This is the poem.

"It was the door,
And terrifying before,
Yes, darkly, for the fifth bubbling air
and the sun grew deeper."

[Laughter.]

Not bad words. [Applause.]

If I had worked longer, it could have been a longer poem—[Laughter.]

Not necessarily a better one. It even has a rhyme, although, of course, that's only by accident.

It took about an hour and I'm not really sure that the effort was justified, because I probably could have written one myself almost as good in that time. But computers read much more rapidly than I do. If you have one at your disposal, after you've written a program, you could probably do a poem just as good as that in three or four seconds, and you could probably do a lot of them. Then, at Christmas, you could give them to all of your friends. [Laughter.]

There is another reason for which I am glad I'm not the Register of Copyrights because, granted that these poems can be called creations of some sort, it strikes me as pretty hard to decide who created them, or what created them. I suppose the problem has already come up, not only in prose and poetry, but surely in music. When my friend, John R. Pierce was the Research Director of Bell Labs, he and some others put together a record of computer-generated music called "Music from Mathematics," and I think that was copyrighted.

So far, I've only been talking about the copyrighting of modes of supplementing or distributing kind, of artistic creation that have already come to exist, specifically those created works which were designed to be read by the eye or heard by the ear. But we have a lot of other senses and there is no reason why some of them cannot be added to our work; in fact, some already have. The nose is the beneficiary of the thing called "Smellovision," when you can see a film with a scent track of perfumes and odors blown through the ventilating system of the theater as you watch the story on the screen. And also with the scratch and sniff patches that sometimes appear in magazines that promote a new perfume or a toothpaste or deodorant.

As far as I know, no enterprising publisher has yet to insert scratch and sniff pages into a novel. It's easy to see how it might work. If you have a strong aroma of pipe tobacco, you'd know Sherlock Holmes was around somewhere. It might help the story along.

The same could be done with taste, with every volume carrying in a little packet over the flyleaf a time-release capsule with all the flavors at a Elizabethan banquet that they were eating, or the one we ate tonight, and so on.

That only takes care of the five known senses—What about extrasensory perception? Most people who know me would be surprised to hear that I have voluntarily brought up the subject of extrasensory perception. I usually stay far away from it because I happen not to believe that it exists. I hate to say this, because every time I do, I make so many enemies. People I don't know generally assume that, as a science fiction writer, I'm supposed to believe in everything—not just telepathy and clairvoyance, but flying saucers and dowsing and the Tooth Fairy——[Laughter.]

And I would like to believe in them, or at least, some of them, but the evidence is simply not any good.

Still, if ESP does exist—and I try to keep an open mind—then it's fairly likely that sooner or later someone will find a way to record it, and then the next step is to create new works in it and sell them. Whereupon, they will need to be copyrighted to prevent some unscrupulous telepath from passing off somebody else's mind emanations as his own. [Laughter.]

And, actually, that may not be entirely preposterous. I said I didn't believe in extrasensory perception; that is, the communication of one person with another without the use of his senses, as in telepathy. But I'm not beyond hope entirely; I do believe that it is possible for a human being to communicate in an extrasensory way with some things that are not human at all. By things that are not human, I don't mean elves or ghosts or aliens from the Planet Mongo; I mean machines. You all know about brain waves. Some of you may have had or certainly may know someone who has had an electrocephalogram, which measures tiny electrical pulsations within the brain to check how well all its parts are functioning. Some of you may have had the experience of seeing your own brain waves, particularly the kind called alpha waves, displayed on a CRT or television monitor.

Unless you have sophisticated electric equipment, you have no way of knowing these waves even exist, which makes it all the more remarkable that some years ago, some experimenters discovered that a good many people could exercise conscious control over the frequency and amplitude of these brain waves. On command, they could make them go faster or slower, they could make the peaks higher or flatter. None of them knew exactly how they did it. Some said they held their breath, some said they bent some kind of muscles, others envisioned particular kinds of scenes, but most of them couldn't give any explanation at all. But they could in fact change the display of their alpha waves at will.

And someone else realized that it would be relatively easy to hook up a machine to read these alpha waves without ever displaying them in any way, or at least in any form that human beings could perceive. Then a machine could be taught—or programmed is a better word—to respond to these unseen, unheard, electrical emanations by going faster or slower, by turning on or off and so on. As far as I know, no one has yet made any practical use of this phenomenon, but it seems to me at least possible that one day you will have to add to facsimile and optical scanning and all the other things that we've been discussing the alpha wave transmission art form.

Well, that's the obligatory fantastic imagining that you have to expect of a science fiction writer—although since the U.S. Court of Appeals ruling in Apple versus Franklin last September, it may not be entirely fantastic. I doubt that much of what I have said would be of direct help to anybody in their deliberations. Still, I would like to take the opportunity to lobby a little bit, if I may. There are some things I would plead with you to keep in mind. Foremost among them is the special consideration that I think is due to the original creator of copyrightable material.

I don't deny that publishers have rights; and they wouldn't let me deny it if I wanted to, but there are many cases of an author losing his rights to a publisher, and I can't think of even one that went the other way. Even today, when writers have battled to achieve better standards, better status at the bargaining table, than in the bad old days, it still happens all too often; sometimes with the writer for hire contract we heard discussed this afternoon, in which many writers simply sign away all rights without knowing what they do.

One major magazine publishing company still automatically sends a writer for hire contract to every contributor. Experienced, or halfway intelligent contributors, or those with good agents send them back indignantly and then they send the real one. But those who are not experienced or have good agents often sign them and then they are bound to forever report that they can't get their rights back.

Some book publishers offer similar contracts. A writer has been around for a while usually can deal with that too, but an inexperienced writer or a hungry one is under strong pressure to sign. And thus his rights are lost to him.

In short, publishers can readily take advantage of writers under some conditions, and unfortunately, some of them do. This is a fact of life that has been recognized in the statute law. For this reason, under the old copyright law the second term of the copyright could be obtained only by the writer himself or his heirs. And I think the creators of copyrightable material are in justice entitled to and often desperately need such special protection, still.

So what I would urge on you, if I might, is to keep a special thought in your minds for the originators of the copyrightable material. Heaven knows, the task of framing copyright legislation for the new high tech media is complex and arduous enough already, but very large sums are potentially involved and my plea is that in providing for proper payments through royalties or licensing fees or whatever, some of that money get back to the creators.

Whether that happens, and to what extent it happens is of course a matter of copyright law. Copyright is dear to my heart as a writer, because it is the only thing I own that is all mine. Let me give you an instance of how important copyright can be to a writer.

Nearly thirty years ago, a young writer who is a close friend of mine died suddenly of a heart attack as a result of injuries received in the Battle of the Bulge, leaving behind a widow and two small children. Both of his children were handicapped. His widow had no choice but to stay home and spend her time with the children. My friend's entire estate, apart from a mortgage, consisted of his copyrights on about eight novels and a score of shorter pieces. If they had not been protected, his family would have been wholly without resources. It is only the income from these copyrights that has kept them off welfare for the last twenty-odd years—Heaven knows, sometimes very poor, but never quite penniless.

But, of course, copyright means more than money to a writer. We had some talk about that this afternoon. It gives him the right to tell a prospective publisher that he cannot publish the work at all unless he publishes it in a way satisfactory to the author. The only way he can do that, really, is by writing it into the contract and that sort of clause usually takes a lot of hard bargaining. But it can be done.

Six months ago, I was in the People's Republic of China which does not honor copyrights. That isn't just a peculiarity of the communists. In all of China's 4,000 year history they have never had a copyright law or anything resembling it. From the point of view of the present government, there's not much incentive to change. Nothing can be published anywhere in China anyway without the smile of the state, and there is no reason for them to protect their writers' residual rights in a literary problem, since the writer's income is subject to a cap. No matter how good his book is or how many copies he sells, he cannot make quite as much as $1,000.00. The payment of royalties simply does not happen. One of the heads of the writers' union told me that every few years, the subject of the royalty payments comes up and is discussed and rejected. "Perhaps," he said, "at some future date, they might institute some sort of bonus for certain writings, but not right away."

On the foreign side, they see no reason to join the International Copyright Convention because that would force them to spend their foreign exchange on rights that they now simply take for nothing. Worse, it might involve them in the arduous problem of writing contracts with the foreign authors who might well demand that what they wrote be published the way they wrote it.

I'd like to give you an example, or an idea, of how the Chinese feel toward the work of western writers they pirate. A given story, instead of being "by John Smith, translated by Yun Yow Dow," may well appear as "by Yun Yow Dow, based on a story by John Smith," Just how much the translated stories are altered to conform with the views of the Chinese authorities I cannot tell you, since I can't read Chinese. But while I was in China, I was given a copy of an anthology, which I was told contained a story of mine and I am now having it translated back into English to find out just what it was that I said there.

On the other hand, the last time I was in the Soviet Union, or I hope it was the last time, I spend some time in the office of one of the largest Soviet publishers, talking with their editor-in-chief. He showed me a new edition of a novel called "The Day of the Triffids," which was written by an English friend of mine named John Wyndham, now deceased.

I remembered that there was a section in the book that suggested that the deadly man-eating plants that the book was all about had come to plague the earth as a result of some illicit biological warfare experiments carried on in Soviet Russia. I was curious to know how they dealt with that, and since I could not read the Russian, I asked the editor if it had given them any political problems. He grinned and shook his head. He said it was no problem at all. He just left it out. [Laughter.]

The other thing they left out—I didn't have to ask him this because I knew—was paying John Wyndham royalties for the publications of his novel. They had not yet signed the Copyright Convention at that time. Their practice, they said, was to pay lavishly in rubles for everything they publish and deposit the money in a Soviet bank to the account of the author so that when he came to the Soviet Union he could draw it out and spend it. That's what they said they did.

In practice, it was a little different. When I first visited the U.S.S.R. in 1971, I came with bright hope because I had had a couple of books published in the Soviet Union, one of them in more than one language, and it had been told to me by a Russian friend that I could live elegantly for a long time in Moscow by spending my accumulated rubles.

Unfortunately, my friend had neglected to tell me that it was fairy gold. It evaporates before your eyes. When I asked for my rubles, the publisher said apologetically that there was a law that said that if they weren't claimed within three years they reverted back to the state, and I had missed the deadline.

Of course, since then, they've signed up with the rest of the world, and now they pay in dollars and sign contracts which they are obligated to carry out. (Which may be the reason why since then none of my works have appeared in the U.S.S.R.)

All of which suggests to me that the passage of the Copyright Law or treaty is not enough to protect the writers' interests by itself, but it certainly is the very first step.

My colleague and fellow Authors Guild council member, Joe Lash, said many of the things this afternoon that I had planned to say myself. I support all he said and enjoyed his talk a great deal, even though it cost me four pages out of this one—though that may not be a bad thing.

So let me end by sharing with you just three specific points that I would like to mention.

First, the economic interests of authors and publishers—electronic and otherwise—are not always the same. Where they differ, it is usually the author who needs statutory protection more than the publisher.

Second, the author has also a moral right in his work. Judge Breyer pointed out that the courts seem to concern themselves more with economics that with morality—but not at all with the moral rights. Neither do our statutes, although in some countries, in particular France, there is a statute on the books which specifically enforces that the author's right to see his work published in a way he wants it or not at all. I wish we had such legislation here.

Third, the need for copyright in the work of authors as against, say, the copyrighting of software, is not the same. Last night's speaker said, quite truly, that for much software a three-year term is plenty, because long before that the software is outmoded anyway. But I think it important to realize that this is not true of works of creation. George Orwell's novel,"1984", is only about a dozen years from going out of copyright in the second term, but it is at the present time—or was last week—number one on the bestseller lists.

So when it comes time to amend the copyright law, I hope writers' rights will not accidentally be lost in the commendable effort to safeguard the rights of others. Of course, it might be that all this would take place in the proper forum without any nudging from any writer or any other person, just by the natural workings of the legislative process. I might believe that—right after I first start believing in ESP, and flying saucers, and dowsing, and the Tooth Fairy.

Thank you very much. [Applause.]

Mr. KEPLINGER. Thank you very much, ladies and gentlemen. For those of you who are going to tour the IBM facility, the bus will be leading at 8:30 sharp in front of the hotel, and proceeding directly from that tour to the airport.

So, thank you very much for your participation this evening. Thanks to Mr. Pohl, thank you very much.

[Whereupon, proceedings were concluded.]

APPENDIX II

CONGRESS OF THE UNITED STATES,
OFFICE OF TECHNOLOGY ASSESSMENT,
Washington, DC, March 8, 1984.

To: Technology Assessment Board.
From: John H. Gibbons.
Subject: Proposed Assessment of Intellectual Property Rights in An Age of Electronics and Information.

OTA was first asked about the subject of intellectual property by a member of the staff of the House Committee on the Judiciary, during the first week of July, 1983. He called to find out about the work OTA was doing in the area of patents and copyrights, and asked if he might meet with members of the CIT program to share thoughts and ideas.

Rick Weingarten met with the staffer in early July. A week later, OTA was asked to testify before that Committee's Subcommittee on Courts, Civil Liberties, and the Administration of Justice on the subject of the "New Information Technology and Copyrights." OTA testified before the Subcommittee on July 21, 1983.

A few days after the hearing, the Committee Staff asked if OTA could do a broader analysis in the form of an assessment of the impact of information technologies on intellectual property protection. A formal letter of request from the House Committee on the Judiciary followed on August 8, 1983.

Independent of the House request, OTA recieived a letter from Senator Charles McC. Mathias, Jr., Senate Committee on the Judiciary, requesting that OTA do a broad study of the relationship between the new technologies for recording and transmitting intellectual property and the copyright laws.

In September and October, OTA staff met with staff from both Committees to duscuss their requests. These meetings led to an OTA workshop on information policy held on December 15 and 16, 1984. The workship was designed to help OTA and Committee staff better understand the underlying issues. This proposal is the result of that workshop.

Staff members from both the House and Senate Committees on the Judiciary have seen early drafts of OTA's proposal for an assessment on intellectual property. They made a few suggestions, which have been incorporated into the proposal.

Attachments.

OTA PROJECT PROPOSAL ON INTELLECTUAL PROPERTY RIGHTS IN AN AGE OF ELECTRONICS AND INFORMATION

Background: The protection of intellectual property was provided for in the American Constitution to foster the development of science and the useful arts, and to encourage the dissemination of information and knowledge to the public. The tension that exists between the aim of temporarily restricting information and the goal of widely diffusing it, while always inherent in the law, has significantly increased in recent years as a result of the rapid development and deployment of new information and communications technologies and of the enhanced value of information. This tension has given rise to a number of public policy issues, which this study will seek to address.

Description. This assessment will identify and analyze trends in the development of the new information technologies to determine those areas where there might be gaps in the laws and practices of intellectual property; it will examine how their widespread deployment and use might alter the value of information and thus affect the future creation, production, distribution use of, and access to information and thus affect the future creation, production, distribution, use of, and access to information and knowledge based products; and it will identify and evaluate policy strategies—legal, technological, economic, and social—for addressing intellectual property issues in an age of electronics.

Examples of some of the issue areas tht might be included for analysis are: (1) the legal and institutional issues resulting from rapid technological change; (2) the technological issues that result from the impact that intellectual property law might have on technology, (3) socio-political issues arising from the public/private aspects of information; (4) the economic issues arising from the enhanced value of information and information services; (5) the international issues resulting from the increased flow and value of information across national boundaries; and (6) the ethical issues arising from the conflict between public laws and private practices.

The report should be especially useful to Congress as its seeks to adapt existing intellectual property law, and to create new laws, to provide for the new technologies.

Requestors: Congressmen Peter W. Rodino, Jr., Robert W. Kastenmeier, Hamilton Fish, and Carlos Moorhead, House Committee on the Judiciary, by the letter dated August 8, 1983; and Senator Charles McC. Mathias, Jr., Senate Committee on the Judiciary, by letter dated July 26, 1983.

Schedule: Begin April 1984; Draft Report, June 1985; Final Draft September 1985.

Coordination with other Agencies: There is no direct overlap with any studies being conducted by any sister agency. Contacts and coordination will be maintained, however, where there is a shared interest. NSF has an on-going working group on intellectual property at which OTA is represented.

Study Plan: See pp. 15ff of the proposal.

Budget. FY84—$271K; FY85—287K; FY86—68K; Total—$620K.

OTA Key Staff Contact: Linda Garcia, CIT Program, 226-2245.

U.S. House of Representatives,
Committee on the Judiciary,
Washington, DC, August 8, 1983.

Hon. Morris Udall,
Chairman, Technology Assessment Board, Office of Technology Assessment, Office of the Director, U.S. Congress, Washington, DC.

Dear Mr. Chairman: We would like to request that the Office of Technology Assessment conduct a study on the subject of "copyright and technological change". Included in this study would be an examination of general concepts as well as an assessment of how these concepts relate to specific legislative proposals in such areas as home taping, record and audio rental, cable television, and copyright protection for semi-conductor chips and computer software. The Office of Technology Assessment, however, need not limit itself to areas where legislation is pending. Thought can be given to new technologies such as satellite communications, optical discs and computerized publishing.

It would be extremely helpful if OTA could fashion—with assistance from Committee staff—questions to be asked for an appropriate study. General questions could include the following: the role of copyright law in reallocating or protecting societal resources; the need to create executive or legislative branch entities to handle such reallocations or protections; the role of the judicial branch (or other dispute resolution bodies or techniques) in enforcing or determining legal rights; and the line that should be drawn between competing demands of consumer and proprietor.

The Committee on the Judiciary has jurisdiction over issues relating to substantive copyright law as well as the Federal judicial branch, the Copyright Royalty Tribunal and the Copyright Office of the Library of Congress. The Subcommittee on Courts, Civil Liberties and the Administration of Justice already has conducted hearings on the general subject of copyright and new technology. The hearings, which commenced on July 20-21, 1983, will continue through the second session of the 98th Congress.

Thank you for your assistance in this important matter.

Sincerely,

Peter W. Rodino, Jr.
Chairman, Committee on the Judiciary.
Robert W. Kastenmeier,
Chairman, Subcommittee on Courts, Civil Liberties and the Administration of Justice.
Hamilton Fish,
Ranking Minority Member, Committee on the Judiciary.
Carlos Moorhead,
Ranking Minority Member, Subcommittee on Courts, Civil Liberties and the Administration of Justice.

U.S. Senate,
Committee on the Judiciary,
Washington, DC, July 26, 1983.

Dr. John H. Gibbons,
Office of Technology Assessment,
Washington, DC.

Dear Jack: I would like to ask the Office of Technology Assessment to do a broad study of the relationship of new technologies for recording and transmitting intellectual property to the copyright laws. My Subcommittee on Patents, Copyrights and Trademarks is working in several areas to update the copyright laws in view of technological developments, and I think such a study would be useful to our efforts. If you wish to discuss the scope of the study in more detail, please call Ralph Oman of my staff at 224-5617.

With best wishes,

Sincerely,

Charles McC. Mathias, Jr.,
U.S. Senator.

Office of Technology Assessment, U.S. Congress

OTA PROJECT PROPOSAL ON INTELLECTUAL PROPERTY RIGHTS IN AN AGE OF ELECTRONICS AND INFORMATION

Congressional interest

The Assessment was requested by Congressmen Peter W. Rodino. Jr., Robert W. Kastenmeier, Hamilton Fish, and Carlos Moorhead, House Committee on the Judiciary, by letter dated August 8, 1983; and by Senator Charles McC Mathias, Jr., Senate Committee on the Jurdiciary, by letter dated July 26, 1983.

This study should be expecially useful to the Congress over the next few years as it seeks to adapt existing intellectual property law, and to create new laws, to address the issues that arise from the development and use of the new information and communications technologies. Already a number of bills have been introduced into Congress that relate to this area. Included among them, for example, are H.R. 1028/S.1201, which would give limited copyright protection to the chip process; H.R. 2985, which would grant copyright protection to "an industrial design"; H.R. 1227/S.31, which would give owners control over the rental market for films and other audio visual materials. The Subcommittees of the Senate and House Committee on the Judiciary that have jurisdiction over copyright and patents have held hearings on a wide range of these issues over the past year, and together the two full Committees sponsored a special seminar in Florida devoted to understanding the new technology. The House Subcommittee on Courts, Civil Liberties, and the Administration of Justice plans to hold additional hearings on the subject of intellectual property sometime this year.

Background

Recent scientific adances in such technologies as microelectronics, photonics, and satellites have led to rapid developments in computers, communications, and other information technologies and have given rise to a vast array of new products and services, changing the way that information and communications are being used and offered in the market place. These developments are having a major effect on how intellectual property is viewed by society, the mechanisms by which it is protected, and its value, both as a market good and as a public resource.

The protection of some forms of intellectual property through the grant of exclusive ownership rights for a limited period of time was provided for in Section 8, Article 1 of the American Constitution. Its purpose was two-fold: to foster the development of science and the useful arts, and to encourage the dissemination of information and knowledge to the public. The tension that exist between the aim of temporarily restricting information and the goal of widely diffusing it, while always inherent in the law, has significantly increased in recent years as a result of the rapid development and deployment of new information technologies and of the enhanced value that, today, is being placed on information. This increased tension has given rise to a number of public policy issues which this study will seek to analyze and address.

Intellectual property was traditionally protected by keeping it secret, or by limiting access to it. Today, however, many of the societal practices and legal remedies that have been used to restrict or to control the flow of information are being undermined, as the widespread deployment of the new technologies allows individuals greater opportunities to selectively access, store, manipulate, alter, and reproduce information in a wide variety of forms. Historical developments in the area of computers illustrate this point. Computer software, for example, required little legal protection in the days when computer software was created and designed exclusively for a particular computer and when computers were so large and expensive that only the government or a large corporation could afford to own one.

Moreover, because many of these technologies require that information be handled in an electronic form, many of the operations performed with or on them can be carried out covertly, and they are thus less subject than they might have been in the past to monitoring or control. For example, the personal computer, the VCR, teletext and videotex, the audio cassette, on-line data bases and soon even the in-home xerox machine all provide easy access for covert copying.

The unprecedented speed with which these technologies are being advanced together with the intense competition in the marketplace that is accompanying their development is making it increasingly difficult for the laws of intellectual property to remain relevant and useful. Thus, as illustrated in the recent cases of *Apple Computer, Inc.* v. *Franklin Computer Corporation* and *Sony Corporation of America* v. *Universal City Studios, Inc.*, there are already technological gaps in the 1976 copyright law and its 1980 amendments, even though the law itself was specifically designed to take into account the emergence of the new electronic technologies.[1] With respect to the Apple case, for example, the law failed to address the important questions of whether copyright law applies to operating code that is readable, for the most part, only by machine, or to information that is embedded in hardware. In the Sony case, it failed to anticipate the rapid growth of the home market for video cassette recorders and how this widespread use of VCRs might effect the intellectual property rights of the film industry.[2]

Pressures to reevaluate the question of how new information and communications technologies might affect and be affected by intellectual property law have intensified greatly in the last few years, as the value attributed to information and to information related products and services has increased. One measure of this trend is the growing importance of software in relation to hardware in information systems. Large computer installations, for example, have long since passed the crossover point where investments in software exceed those in hardware. Some estimates place the ratio at four dollars of investment in software for every dollar invested in hardware. As a result, the commercial market for computer software is growing rapidly. One market research group predicts, for example, that computer software sales in the United States will triple from $4.5 to $13.5 billion by 1986. While owners of small softwares are not yet to the point of such major proportional investments in software, the demand for personal computer software is expected to rise faster than the demand for hardware.

Because of the rapid and tumultuous changes that are now taking place in the area of information technologies, premature efforts to update intellectual property law may restrict access to information, stifle innovation, and dampen competition in the industry. On the other hand, failure to act soon may entail severe economic penalties, both domestically and internationally, and may contribute to what seems to be a waning of public support for and acceptance of intellectual property protection. It has been suggested, for example, that the public might be more reluctant to photocopy today had the Congress acted before 1976 to revise the copyright law.

Given the growing importance of information, the stakes in the outcome of today's debate about intellectual property—for the producers, the providers, and the users of information products and services as well as for society as a whole—are unusually high. It is for this reason that the courts are increasingly looking to the Congress to address the the issues to which the technological gaps in existing intellectual property law give rise.

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[1] Many of the changes in the 1976 copyright law as it was amended in 1980 are based on the recommendations of the National Commission on New Technological Copyrighted Work, a group that was established in 1974 by the Congress to specifically address a number of computer and photocopy related issues. The Commission's recommendations were presented to the Congress in a "Final Report of CONTU," Library of Congress, July 31, 1978.

[2] Some people believe that the issues in the *Apple* v. *Franklin* case remain unresolved, since after a 20-month litigation battle, Franklin Computer Corporation has decided not to argue its case before the Supreme Court and to pay Apple Computer Corporation $2.5 million in damages for allegedly plagiarizing copyrighted software. The Sony Case was resolved by the recent Supreme Court decision in which, by a margin of 5–4, the Court ruled that owners of video recorders did not violate copyright law by taping television programs for their own use.

Delivering the Supreme Court's decision in the recent Sony case, Associate Justice John Paul Stevens said, for example, that [3]

> From its beginning, the law of copyright has developed in response to significant changes in technology. Indeed, it was the invention of a new form of copying equipment—the printing press—that gave rise to the original need for copyright protection. Repeatedly, as new developments have occurred in this country, it has been the Congress that has fashioned the new rules that new technology made necessary.
>
> The Judiciary's reluctance to expand the protection afforded by the copyright without explicit legislative guidance is a recurring theme. . . . Sound policy, as well as history, supports our consistent deference to Congress when major technological innovations alter the market for copyrighted materials. Congress has the constitutional authority and the institutional ability to accommodate fully the varied permutations of competing interests that are inevitably implicated by such new technology.

To assist the Congress in any new effort that it might undertake to review the laws of intellectual property, this assessment will identify and analyze trends in the development of information technologies to determine those areas where there might be gaps in the laws and practices that protect intellectual property. Secondly, it will examine how the development and widespread use of these technologies might alter the value of information and thus affect the future creation, production, distribution, use of, and access to information and knowledge based products and services. Thirdly, it will identify and evaluate policy strategies—legal, technological, economic, and social—for addressing intellectual property issues in an age of electronics.

Technological advances

The growing convergence of computer and communications technologies and the deregulation of the telecommunications industry will enhance the public's access to information, and thereby have a significant effect on the use and protection of intellectual property.

Under the stimulus of technology and deregulation, for example, vendors are bringing to market a broad range of specialized communications services. There are local area networks for use within a business complex to tie together word processors, desktop computers, and mainframe computers. Specialized carriers and private networks are beginning to provide new telecommunications capabilities that compete with the telephone company's "local loop" of cooper wire. Cellular radio offers low cost and widely available mobile telephone service. AT&T and its competitors are all developing new enhanced long distance voice and data communications services, based on satellites, fiber optics, and microwave radio. Data base vendors are offering information on a growing variety of subjects over telephone lines, and plans are under way for two-way interactive cable television based systems to disseminate information and transact business. Within this century, communications engineers see us as approaching what they refer to as an Integrated Services Digital Network (ISDN), in which one can transmit information of any type (voice, video, facsimile, computer data) at high speed between any two points on earth—all over an interconnected network.

A similar diversity also characterizes the computer market. Computers based on integrated circuit technology are proliferating rapidly. A wide range of systems now exist for data processing in many diverse applications, from long term weather forecasting to home budget management. Supercomputers, large mainframes, mini's, and desktop or personal computers are all commercially available. At the smallest end of the scale, it becomes hard for a consumer to even recognize that he or she is purchasing a computer—microprocessors are now standard components of a myriad of products. The capability of these machines continues to grow rapidly with performance/cost ratios nearly doubling every two years.

For television watchers, many new choices are becoming available. Traditional broadcasting is now being challenged by two-way cable, low power broadcast, direct broadcast satellites, multipoint distribution systems, video disks (both optical and capacitance), video cassettes and, in the future, high resolution television. Audio technology is experiencing new competition. AM stereo is becoming available and an audio laser disk has recently been introduced to the market.

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[3] *Sony Corporation of America, Et. Al. Petitioners* v. *Universal City Studios, Inc., etc. et. al.*, "Supreme Court's Decision in 'Betamax' Case", No. 81-1687.

To this must be added the advent of new technologies for the creation of video and audio programming. Computer graphics, for example, are increasing in sophistication as more powerful computers are developed and as they become affordable for commercial media producers. Some graphic experts say that we are within a decade of being able to create fully realistic images, even of people, by computer. In the same way, sound generation technology is advancing in applications that may provide new media for performance, or cost effective ways of replacing the human voice.

All of these new technologies supplement, extend, or improve in some sense the existing information services provided to the home and office. For example, Teletext and Videotex services will not only provide access to information in a new form but also a host of new types of services. Promoters are already experimenting with electronic news, in-house shopping and banking, and electronic mail. Remote medical consultation, education, and other social services can also be provided.

Issues

Examples of some of the specific issue areas that we plan to analyze are:

The legal and institutional issues resulting from rapid technological change;

The impact of intellectual property protection on technological development;

The economic issues arising from the rapid growth of the information industry and the enhanced value of information and information related products and services;

The sociopolitical issues arising from the public/private aspects of information;

The international issues resulting from the increased value and flow of information across national boundaries; and

The ethical issues arising from the conflict between public laws and private practices.

Legal and institutional issues

There are currently at least five different legal remedies for protecting intellectual property—trade secret protection, trademark protection, patent protection, protection under the law of unfair competition, and copyright protection. With the advances in information and communications technologies and the tremendous expansion in the number and variety of information products and services that are now available to the public, questions arise as to which of these remedie, if any, are the most appropriate means for protecting specific forms of intellectual property embedded in or transmitted by one of the new information or communications technologies. In the recent case, *Apple Computer, Inc.*, v. *Franklin Computer Corporation*, Franklin contended, for example that computer operating systems programs, as distinguished from application programs, are not the proper subject of copyright "regardless of the language or medium in which they are fixed." Similarly, questions are also being raised about how well electronic data bases can be protected under copyright law, since their content is never really fixed. It has been suggested, moreover, that some of the efforts that have been made to stretch existing intellectual property law far enough to provide protection for information and knowledge that is stored, processed, or transmitted in an electronic form have only served to deprive the law of its historical basis and traditional meaning.[4]

Because of the difficulties entailed in identifying and enforcing infringements of intellectual property law in the area of information and communications technologies, and because of the particularly high stakes that are involved in the outcome of these kinds of disputes, the question also arises as to whether the present institutional structure is well designed or could be better adapted to address these issues.[5]

Technological issues

Intellectual property laws may either foster or hinder technological developments. It is generally argued, for example, that the lack of computer software protection has hindered technological developments in this area. On the other hand, the producers of information hardware contend that the extension of intellectual property protection to software might actually hinder the technological development of their products. To make their case, they point to the fact that the video cassette recorder was dependent for its development on easy access to programming, and that the personal computer was dependent for its development on the widespread availability of computer software. Or, as it has been argued, the lack of legal protection mechanisms might stimulate the development of technological ones. Issues arise, therefore, as to how intellectual property laws might affect the development of different technologies and as to whether they might favor the development of one technology over another.

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[4] See, for example, the dissenting opinion of Commissioner John Hersey, in the CONTU Final Report, op. cit., p. 37.

[5] In its letter of request, the House Committee on the Judiciary raised these issues, asking OTA to look into the question of whether or not there is a need to create executive or legislative branch entities to resolve issues involving the protection and distribution of intellectual properties.

Economic issues

The information industry is one of the most dynamic sectors of the U.S. economy. It is responsible for approximately $500 billion of annual revenue and is growing at an annual rate of about 20 percent.[6] Because of recent advances and developments in the area of information and communications technologies, it is an industry, moreover, that is in a state of tremendous change. Within the short period of the last eight to ten years, for example, the information industry has been transformed from one that produced a distinct, and therefore relatively scarce, product for a particular and narrow segment of the market to one that produces a rather undifferentiated, and therefore relatively plentiful, product for a mass market.[7]

While such a market may be an optimal situation for the information consumer, it is a highly competitive and risky one for the producers and distributors of information products and services. And in such a marketplace, where there are such large amounts of money at stake, the law of intellectual property may provide one class of producers and providers a key advantage over others, and thus significantly affect the structure of the overall market. How different approaches for dealing with intellectucal property might affect different kinds of information providers and distributors and the structure of the information market as a whole is, therefore, an important economic issue that needs to be addressed.

Social political issues

Inherent in the American approach to intellectual property law is the conflict between the need to provide incentives for innovation and the need to ensure the freest possible flow of information. This conflict is enhanced in an age of information, when individuals need greater information and knowledge in order to effectively participate in and reap the benefits of society, but also when information and knowledge are treated less and less as a free good and more and more as a commodity to be bought and sold in the marketplace. In the past, access to intellectual properties was provided to those who could not afford to pay for them through nonprofit institutions such a libraries and schools on the basis of fair use provisions in the law. Giving the mounting pressures that we see today to extend ownership rights to many of the new information products and services, questions arise about whether or not fair use practices will be adequate in the future to assure equitable and socially optimal access to and distribution of information throughout society.[8]

International issues

As broadcast satellites and high-power radio and television transmitters regularly extend their signals across national boundaries, information systems are becoming increasingly international and information products and services are coming to represent an every more important part of our export market.[9] However, just as the new technologies have enhanced the ability of the American public to gain free access to the goods and services that these technologies provide, so too have they made it easier for other countries to do so. Problems have arisen for the United States most recently, for example, protecting the ownership rights of U.S. broadcasters whose programs are being received and rebroadcast without recompense in Canada and the Caribbean Basin.[10] As the international exchange of information

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[6] The information industry is defined here to include: the computer and office equipment industry, the computer software and services industry, the telecommunications industry, and the publishing, film, and broadcasting industries.

[7] Statement of William Lilley, III, Vice President, Corporate Affairs, CBS, Inc., Proceedings, Congressional Copyright and Technology Symposium, Ft. Lauderdale, Florida, February 5, 1984.

[8] In the recent Sony case the Supreme Court interpreted the fair use doctrine to apply to home taping, ruling that the use of home recorders was 'time shifting' and as such it falls within the 'fair use' exception to the legal right to control use of copyrighted material.

[9] The Motion Picture Producers Association estimates, for example, that theater, television and home video rentals produce annual gross foreign revenues from of $3 billion. This represents a positive balance of trade for the United States of $1 billion.

[10] The United States is a member of the Rome Convention for the Protection of Performers, Producers on Phonograms, and Broadcasting,organizations. This convention, however, makes no

Continued

and information products takes on even greater importance in the world economy, a growing number of international issues that focus on questions of intellectual property will most likely emerge.[11] Apart from how these issues might best be resolved, the question also arises as to whether or not existing domestic and international institutions will be able to effectively deal with them.

Ethical issues

The new information and communications technologies are changing the public's expectations about its rights to use them. For just as the public became readily accustomed to photocopying books, journals, and other printed materials, so too it is now learning to routinely copy films, disks, and tapes and to make unauthorized copies of electronic data. Software creators, producers and providers call this 'stealing'; some software users call it 'sharing.' Thus there is a growing gap between the theory of intellectual property law and its practice. This gap is likely to widen in the next several years, potentially challenging the legitimacy of the law and creating significant problems of enforcement. As a result, a number of ethical issues will most likely emerge in the future.

Methodology

As a means of identifying and analyzing the issues as they have been outlined above, the proposed study will (1) project plausible future trends in the development of communications and information technologies; (2) identify and trace the historical basis of intellectual property law; (3) identify the potential gaps in existing intellectual property law that may result from these technologieal developments; (4) identify and describe the changing role and value of information both in the economy and in society, at the international as well as the national level; (5) identify and describe the range of interests and values with respect to intellectual property; and (6) identify and outline alternative approaches to addressing problems of intellectual property as they relate to information and communications technologies.

1. Technology projections

To identify potential problems with existing social and legal mechanisms for dealing with issues relating to intellectual property that arise from the development and use of the new information and communications technologies, a trend analysis will be made of plausible future technological developments in this area. This analysis will be based not only on projections of scientific advances in this area, but also on projections of the social and economic trends that might affect their development, deployment and use. Where appropriate, materials will be drawn from other OTA assessments, such as the technology case studies prepared for the assessment on "Information Technology Research and Development", International Competitiveness in Electronic," "Information Technology and Its Impact on Education", "International Cooperation and Competitiveness in Civilian Space Activities", and "Commercial Biotechnology: An International Analysis."

2. Historical analysis

An analysis that describes and traces the historical basis of intellectual property law will help to identify and provide criteria for evaluating the social choices that we are confronted with today in striking a balance between the goal of stimulating invention and creativity and of diffusing information and knowledge. This historical account will include a discussion of the development of software as a form of intellectual property, and describe how the accepted practices of its use have changed over time as its value has increased.

3. Review of gaps in intellectual property law and evaluation of the institutional structure for dealing with them

Over the past few years, the court system has been asked to resolve an increasing number of disputes created by the technological gaps that have developed in the laws of intellectual property. As part of this assessment, an effort will be made to survey the extent of these gaps and to identify legal and institutional remedies that might be adopted to more effectively deal with them. Moreover, building upon the projections of technological trends, an effort will be made to identify where new

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provisions for cable and satellites, and only recognizes limited exclusive rights of broadcasters to control the use of their programs.

[11] The British government has estimated, for example, that the international market for information goods and services will grow from 50 billion pounds in 1982 to 150 billion pounds by 1990. "The Age of Electronic Information," Department of Trade and Industry, United Kingdom, 1981.

legal gaps might emerge or where institutional changes might be required in the future.

4. The changing role and value of information

The development and widescale deployment of information and communications technologies have helped to give rise to what many social observers have come to characterize as an information society in which information will be major resource, and in which its creation, use, and communication will play a central role. As the role of information in society changes, so too does the balance between the ways in which society seeks to encourage innovation and intellectual creativity and the means by which it seeks to foster the dissemination of information and knowledge. In this study, an effort will be made to determine how the changing role of information brought about by the new technologies might affect that balance. Moreover, since information in its present role is relatively new and distinct from other critical social and economic resources,[12] an effort will be made to determine the extent to which it can in fact be treated as a traditional form of property.

5. The range of interests and values with respect to intellectual property

Because of the wide diversity of information products and services, there are also a great many different and often conflicting values and interests at stake in the outcome of the present debate about intellectual property. The positions of software producers, for example, are often at odds with those of hardware producers; the interests of creators different from those of providers and distributors; the wishes of small companies diverse from those of large companies; and the needs of the public in conflict with those of the private sector. In this assessment, therefore, an attempt will be made to identify these values and interests and to determine how different approaches to dealing with intellectual property as it is created, embodied, transmitted and used in information and communications technologies might affect each of them.

6. Alternative approaches to addressing intellectual property issues

Intellectual property law is one approach to fostering the development of science and the useful arts while encouraging the dissemination of information and knowledge to the public. Recently, a number of questions have been raised about whether or not new legal remedies are required or are even appropriate to stimulate the development and use of the new information and communications technologies. A number of alternative approaches have been suggested, ranging from those that call for increased public education to those that call for technological solutions. In this assessment, an effort will be made to identify the range of alternative strategies and to evaluate them in terms of how effective they might be in accomplishing the dual aims inherent in intellectual property law and in terms of how they might affect the various interests at stake.

Advisory panel

The Advisory Panel for this study will be selected to represent a broad range of relevant disciplines, experience, and perspectives. It will consist of approximately 15 members who will represent or who will have an expertise in the following areas: intellectual property law, the economics of information, the politics of information and intellectual property, the software industry, the hardware industry, the publishing industry, the interests of authors, the "fair use" of information (libraries, schools, universities, etc.), information consumers groups, the data base industries, the cable industry, the film/television/recording industry, and ethics and philosophy.

The Advisory Panel will be supplemented by a number of working groups, at least one of which will be devoted to the legal aspects of intellectual property, one of which will focus on the economics of information, and one of which will examine the role of information as a public good.

The study would be initiated in April 1984, a final report is scheduled to be presented to the Technology Assessment Board in fall, 1985, and a printed version to the requestors by December 1985.

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[12] As Harlan Cleveind has noted, information is distinct from other resources insofar as it is human, expandable, compressible, substitutable, transportable, diffusive, and shareable. Many of these characteristics make it difficult to "protect." For a discussion of these points, see for example, Harlan Cleveland, "King Canute and the Information Resources," Forum, #12. January 1984.

ESTIMATED PROJECT BUDGET—INTELLECTUAL PROPERTY RIGHTS IN AN AGE OF ELECTRONICS AND INFORMATION

	Fiscal year—			Total
	1984	1985	1986	
Budget line:				
1	50	100	20	170
2	30	60	15	105
3	20	25	0	45
4	160	85	5	250
5	5	5	2	12
6	0	0	20	20
7	4	10	4	18
Total	271	287	68	620

Informational Technology and Its Impact on American Education

Summary

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Office of Technology Assessment
Washington, D.C. 20510

Office of Technology Assessment

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The Technology Assessment Board approves the release of this report. The views expressed in this report are not necessarily those of the Board, OTA Advisory Council, or of individual members thereof.

Foreword

Over the last decade, American education has come to face a number of new demands that must be met with limited resources. Many of these new demands arise from the growing dependence of our society on high technology as a basis for domestic economic growth, international competitiveness, and national security. In October 1980, the House Committee on Education and Labor, its Subcommittee on Special Education, and the Subcommittee on Science, Research, and Technology of the House Committee on Science and Technology asked OTA to examine the extent to which information technology could serve American needs for education and training.

This report documents two basic sets of conclusions:

1. The so-called *information revolution*, driven by rapid advances in communication and computer technology, is profoundly affecting American education. It is changing the nature of what needs to be learned, who needs to learn it, who will provide it, and how it will be provided and paid for.
2. Information technology can potentially improve and enrich the educational services that traditional educational institutions provide, distribute education and training into new environments such as the home and office, reach new clients such as handicapped or homebound persons, and teach job-related skills in the use of technology.

The OTA report provides an overview of the issues relating to the educational applications of the new information technologies. It examines both the demands that the information revolution will make on education and the opportunities afforded by the new information technologies to meet those demands. Rather than focusing on a single technology, it examines the full range of new information products and services such as those based on the combined capabilities of computers, telecommunications systems, and video technologies. Similarly, the report surveys a broad range of educational providers, and examines how the application of information technologies may affect their abilities to provide education and their respective educational roles.

OTA acknowledges with thanks and appreciation the advice and counsel of the panel members, contractors, other agencies of Government, and individual participants who helped bring the study to completion.

John H. Gibbons

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Informational Technology and Its Impact on American Education

Modern society is undergoing profound technological and social changes brought about by what has been called the information revolution. This revolution is characterized by explosive developments in electronic *information technologies* and by their integration into complex information systems that span the globe. The impacts of this revolution affect individuals, institutions, and governments—altering what they do, how they do it, and how they relate to one another.

If individuals are to thrive economically and socially in a world that will be shaped, to a large degree, by these technological developments, they must adapt through education and training. Already there is evidence of demands for new types of education and training, and of new institutions emerging to fill these demands. The historical relationship between education and Government will be affected by the role that Government plays in enabling educational institutions to respond to the changes created by these technologies.

Background

Historically, the Federal Government's interest in educational technology has been sporadic—rising as some promising new technology appeared and falling as that technology failed to achieve its promise. Attention was focused, moreover, on the technology itself and not on the broader educational environment in which it was to be used. In the late 1960's, for example, the Federal Government funded a number of research and development projects in the use of computer-assisted instruction (CAI). Interest in the projects waned, however, given the high costs of hardware and curricula and the failure to integrate computer-based teaching methods into the institutional structure of the school.

Computer-based education is the use of computers for educational purposes. It includes:

1. Computer-managed instruction (CMI).—Wherein learning takes place away from the computer, which [illegible] [illegible] results, advises the student [illegible] and manages student records and other information.
2. Computer-assisted instruction (CAI).—Wherein the student receives individualized instruction by interacting via a computer terminal with the instructional material logic stored in a computer.

Over the last decade, Federal funding for research and development (R&D) in educational information technology has dropped precipitously. At the same time, development and applications of information technology have advanced rapidly in many sectors. Public schools, beset by problems that such technology might mitigate, have lagged behind in adapting to technological changes. In view of this situation, OTA was asked in October 1980 to reexamine the potential role of new information technology in education. The assessment was initiated at the request of: 1) the Subcommittee on Select Education of the House Committee on Education and Labor; and 2) the House Subcommittee on Science, Research, and Technology of the Committee on Science and Technology.

This report examines both the demands the information revolution will make on education and the opportunities afforded to respond to those demands. Included in its scope are a survey of the major providers of education and training, both traditional and new, and an examination of their changing roles. The full range of new information products and services rather than any single technology is examined, since the major impact on education will most likely stem from the integration of these technologies into instructional systems.

For this report OTA has defined *education* to include programs provided through a variety of institutions and in a variety of settings, including public schools; private, nonprofit institutions that operate on the elementary, secondary, and postsecondary levels; proprietary schools; training and education by industry and labor unions; instruction through the military; and services provided through libraries and museums or delivered directly to the home. *Information technology* is defined to include communication systems such as direct broadcast satellite, two-way interactive cable, low-power broadcasting, computers (including personal computers and the new hand-held computers), and television (including video disk and video tape cassette).

The assessment was premised on three initial observations and assumptions:

- The United States is undergoing an information revolution, as documented in an OTA assessment, *Computer-Based National Information Systems.*
- There is a public perception that the public schools are "in trouble," and are not responding well to the normal educational demands being placed on them. Public schools in many parts of the country are faced with severe economic problems in the form of rapidly rising costs and reduced taxpayer support. These pressures are forcing a new search for ways to improve the productivity and effectiveness of schooling.
- A host of new information technology products and services that appeared capable of fulfilling the educational promises anticipated earlier are entering the marketplace with affordably low cost and easy accessibility.

Findings

OTA found that the real situation is far more complex than assumed above. In summary, the assessment's findings are:

- The growing use of information technology throughout society is creating major new demands for education and training in the United States and is increasing the potential economic and social penalty for not responding to those demands.
- The information revolution is creating new stresses on many societal institutions, particularly those such as public schools and libraries that traditionally have borne the major responsibility for providing education and other public information services.
- Information technology is already beginning to play an important role in providing education and training in some sectors.
- Information technology holds significant promise as a mechanism for responding to the education and training needs of society, and it will likely become a major vehicle for doing so in the next few decades.
- Much remains to be learned about the educational and psychological effects of technological approaches to instruction. Not enough experience has been gained with the new information technology to determine completely how that technology can most benefit learners or to predict possible negative effects of its use. Given this insufficient experience, caution should be exercised in undertaking any major national effort, whether federally inspired or not, to introduce these new technologies into education.

Photo credit: © Ted Spiegel, 1982

Personal-type computers are used for instruction in many classrooms throughout the Nation

The Information Society

Role of Information

For the foreseeable future, information technology will continue to undergo revolutionary changes. The microprocessor—an inexpensive, mass-produced computer on a chip—will become ubiquitous in the home and office—not only in the easily identifiable form of the personal computer or word processor, but also as a component of numerous other products, from automobiles to washing machines and thermostats. High-speed, low-cost communication links will be available in such forms as two-way interactive cable, direct broadcast from satellites, and computer-enhanced telephone networks. New video technologies such as video disks and high-resolution television will be available. These technologies will be integrated to form new and unexpected types of information products and services, such as videotex and online information retrieval systems that can be provided over telephone or air waves directly to the home.

It is impossible to predict which of these technologies and services will succeed in the competition for consumer dollars, or which will appeal to particular markets. It is, however, reasonable to conclude that they will radically affect many aspects of the way society generates, obtains, uses, and disseminates information in work and leisure.

The growing importance of information itself drives and is driven by these rapid technological changes. Until a few decades ago, the information industry—that industry directly involved with producing and selling information and information technology—was relatively small in economic terms. It is now becoming a major component of the U.S. economy. While most economists still talk about the traditional economic sectors—extractive, manufacturing, and service—some now have begun to define and explore a fourth, the information sector. One analysis has shown that this new sector, if defined broadly, already accounts for over 60 percent of the economic activity of the United States.

Many firms involved directly with information are large and growing. Two of the largest corporations in the world, AT&T and IBM, principally manufacture information products and provide information services. Moreover, business in general is beginning to treat information as a factor of production that takes its place beside the conventional factors of land, labor, and capital. In addition, the Government is beginning to treat information as an important element of national security. While defense officials have always been concerned about the disclosure of military information—such as troop movements or weapons design—they are now also concerned about the international leakage of more general U.S. scientific and technical information that other countries could conceivably use to pursue economic or military goals that are in contrast to our own.

Photo credits © Ted Spiegel, [illegible]

Information technology is proving to be invaluable to people of all ages

In addition to serving as an economic good, access to information is becoming increasingly important for individuals to function in society effectively as citizens, consumers, and participants in political processes. Relations with government at all levels are becoming more complex—whether they involve dealing with the Internal Revenue Service, applying for social benefits and services, or seeking protection from real or perceived bureaucratic abuse. Individuals are confronted with the need to evaluate more sophisticated choices and to understand their rights and responsibilities under the laws and regulations intended to protect them in the marketplace.

Information Technologies

The rapid evolution of the following technologies in the last few decades has shaped the information revolution:

Cable.—Cable systems—wherein data and programs are transmitted over a wire rather than through airwaves—are growing rapidly. The newer systems offer more channels, and some offer two-way communication.

Satellite Communication.—Satellites have stimulated development of new types of television networks to serve cable subscribers and earth station owners with specialized programing.

Digital Telephone Network.—The shift to digital transmission will allow telephone lines to carry more information at higher speed and with greater accuracy, providing better linkage of information between computer terminals.

Broadcast Technologies.—Some distribution technologies in the entertainment market may also have important potential educational uses. For one, the *direct broadcast satellite* can transmit a program directly to a home or office, bypassing a cable system. For another, *low-power stations,* which restrict transmission to a limited geographical range, provide a low entry cost to licensees and are subject to less regulation than are traditional broadcast stations.

Computers.—The design and uses of computers have advanced to the point where there is now a mass consumer market for computers and computer software. Moreover, networks that link privately owned computers have expanded access to information. *Desktop computers* are becoming more common in the home, the small business, and formal educational settings. The use of *hand-held computers,* cheaper and more portable than desktop computers, has also increased. Along with computer development have come advances in the interface between humans and computers—input/output technology. Input technology is the process of putting information into the computer—either by typing it, speaking to the computer, or showing the computer pictures. Developments in output technology, or "peripherals," are occurring in the areas of low-cost printers, graphics (particularly color graphics), and voice.

Storage Technology.—Data programs are stored on a variety of media for use in the computer: silicon chips, floppy disks, and hard disks. Improvements are being made in such technology for both large and small computers.

Video Technology.—Significant developments in several areas of video technology are likely in this decade. *Video cassette recorders* are already important consumer devices. The *filmless camera*, which combines video and computer technology to "write" a picture on a very small, reusable floppy disk, may soon be available.

Video Disks.—Resembling a phonograph record, a disk that stores television programing is of considerable interest to educators. It is durable, inexpensive to produce, and capable of storing a large amount of data and programs.

Information Services.—Several of the aforementioned information technologies are now being integrated into information systems. For example, several countries now use the existing television broadcast medium to bring information services to homes and offices. Using a *teletext* system, the user can select a page for special viewing as it is transmitted in segments over the air. In a videotex system the user can preselect a page from the central system for immediate viewing. Closely related to videotex are the *information networks* that provide owners of desktop computers and terminals with access to computer and data services and to one another over communication networks. Through *electronic conferencing*, geographically separated individuals can participate in meetings. Variations include *audio conferencing*, which uses telephone lines; *video conferencing*, which supplements the voice connection with television images; and *computer conferencing*, which involves transmitting messages through a central computer that then distributes them as requested.

Impacts on Institutions

Impacts from the information revolution are being felt by government at all levels and by the military, industry, labor unions, and nonprofit service institutions. Traditional services provided by these institutions now overlap in new ways and offer a wide variety of new services based on information technology. For example, firms as diverse as investment houses and retail stores now compete with banks by providing a variety of financial services. Banks, on the other hand, are beginning to compete with computer service bureaus in providing more general on-line information services to businesses and homes.

The U.S. Postal Service, along with Congress and a variety of Federal executive and regulatory agencies, is considering the degree to which it should compete with private telecommunications firms in the provision of electronic mail services. Large computer firms such as IBM are moving toward direct competition with traditional telecommunication common carriers such as AT&T for the provision of information services. Telephone companies may offer "electronic yellow pages" that could rival the classified advertising business of newspapers.

Those institutions principally concerned with the collection, storage, or transfer of information will feel the greatest effects. They include both private sector firms—in fields such as publishing, entertainment, and communications—and public or nonprofit organizations such as libraries, museums, and schools. How they handle their product—information—may differ from the handling of tangible goods by other institutions because information has characteristics that differentiate it from tangible goods. For example, information can be reproduced easily and relatively inexpensively. It can be transported instantly worldwide and presumably can be transferred without affecting its original ownership. Thus, copyright or other forms of protection for intellectual property—data bases, programs, or chip designs—is important to the growth of the information industry.

While the business of selling information has always existed in some form—e.g., book publishing, newspapers, or broadcasting—the growth of this sector and its movement into electronic forms of publishing will create conflicts with traditional societal attitudes about information. The concept of information as a public good whose free exchange is basic to the functioning of society is inherent in the first amendment to the Constitution and underlies the establishment of public libraries and schools. This concept conflicts with the market view of information, which recognizes that there are inherent costs in the provision of information. Adopting new information technologies will entail extra costs that must be borne somehow by the users of those technologies.

The conflict between the view of information as a market good and the view of it as a "public good" affects public institutions in a number of ways. Public nonprofit institutions find themselves increasingly in competition with private profitmaking firms that offer the same or similar services. Institutions such as libraries, schools, and museums are beginning to feel pressure to incorporate both nonprofit and income-generating offerings in their own mix of services. To the extent that previously free or very low-cost and widely available information services such as education move into the private marketplace, access to them may become limited, either because of their cost or because of their restricted technological availability. Periodicals previously available at newsstands, for example, may be available in the future only via computer or video disk.

New Needs for Education and Training

The information revolution places new demands on individuals, changing what they must know and what skills they must have to participate fully in modern society. It may also be increasing the social and economic prices that will be paid by those who do not adapt to technological changes. For instance, spurred by increasing domestic and international economic competition, U.S. industry is expected to adopt computer-based automation in a major way. Computer-aided design, robotics, and other new computer-based manufacturing technologies will, within the next decade, transform the way goods are manufactured. Automation will not be restricted to the factory, however. Office automation will, according to some, have an even more revolutionary effect on management and on clerical work in business. Over the longer term, even the service professions, such as law and medicine, will be transformed.

While some sociologists suggest that the effect will be to "deskill" labor by lowering the skill requirements for workers, more anticipate that a greater premium will be placed on literacy, particularly technological and information literacy. The latter argue that an increasing number of jobs will be in the information sector or will require the use of information systems. Moreover, new forms of production and information handling will create new jobs requiring new skills. Vocational education and industrial training programs will be needed to teach the skills for jobs such as robot maintenance or word processing.

An advanced information society will place a premium on skills oriented toward the creation of new knowledge and the design of new technologies. Thus, while there is some current debate about a possible surplus of college graduates, generally speaking many experts see a growing gap between the demand and supply of graduates in engineering and science, and particularly in computer engineering and science.

A key element in all of these educational needs is that they will constantly change. In a rapidly advancing technological society, it is unlikely that the skills and information base needed for initial employment will be those needed for the same job a few years later. *Lifelong retraining is expected to become the norm for many people.*

Case Studies on Information Technology

In addition to using existing information for this assessment, OTA undertook case studies designed to gain insights into the successful application of information technology in education. Accordingly, OTA examined well-established programs in public school systems, industries, libraries, museums, the military, special education, and direct to the home markets nationwide. These case studies are presented in the appendix of the full report. Many of the findings presented in this assessment reflect observations made in these studies. *The most important of these observations is that information technologies can be most effectively applied to educational tasks when they are well integrated in their institutional environments.*

Potential Technological Solutions

OTA found little evidence of current hardware limitations that would limit the applicability of technology to education and, hence, call for major research efforts. Continuing research in the general fields of computer science and engineering, coupled with innovative private sector development, will provide the necessary hardware base. The only exception is the area of technology for the handicapped, where it is not clear that the opportunities for developing specialized technology could be met without some Federal support for R&D. There does appear to be a need, however, for R&D focused on developing new techniques and tools for software development, human/machine interface, and improving the understanding of cognitive learning processes.

If properly employed, information technology has certain characteristics that suggest it will be invaluable for education. For one, information technology may be the only feasible way to supplement teaching capability in schools faced with reduced teaching staffs and larger class sizes. For another, information technology is capable of distributing education and training, both geographically and over time. Services can be provided in the home, at work, in a hospital, or in any other location where and when they may be needed.

Many of the electronic media, such as video disks or microcomputers, allow learners to use them at their convenience, instead of being locked into specifically scheduled times. Computer-based analysis, combined with a flexible, adaptive instructional system could diagnose and immediately respond to differences in learning strategies among students and, hence, could be more educationally effective. Finally, much work has been done on using information technology to improve the ability of foreign students and the physically and mentally handicapped to communicate.

Some experts suggest that the use of computers by students teaches them new ways of thinking and new ways of solving problems that may be more appropriate in an information age. They suggest that a generation that grows up with computers will have a significant intellectual advantage over one that does not. Many educators criticize such a view as being too technology-centered. At the very least one can predict, however, that computer and computer-based information services will be ubiquitous by the next century, and that learning how to use them effectively is a basic skill that will be required for many and perhaps most jobs. (In response to this view of future skill requirements, many schools have placed a high priority on computer literacy as the first instructional use of the computer.)

Although experience with educational technologies has demonstrated that they offer a variety of potential benefits, it has also demonstrated that technology cannot, by itself, provide solutions to all educational problems, nor should it be imposed on an educational system without sensitivity to institutional and societal barriers that could prevent the realization of educational benefits. These barriers include:

Institutional Barriers.—New educational technology must be designed for ease of integration into the schools and other educational institutions that will use it. Some adaptations of curricula, schedules, and classroom organization will be needed, but the changes are not likely to be extreme.

Teacher Training.—Widespread use of technology in the classroom will require that teachers be trained both in its use and in the production of good curriculum materials. Too few teachers are so qualified today. Schools maintain that they are already faced with a shortage of qualified science and mathematics teachers (those most likely to lead the way in computer-based education). Furthermore, there is little evidence that most of the teacher training colleges in the United States are providing adequate instruction to new teachers in the use of information technology.

Lack of Adequate Software.—OTA found general widespread agreement that, with few exceptions, the quality of educational software—curriculum material designed for educational technology—now available was, in general, not very good. Curriculum providers do not yet use the new media to full advantage for several reasons. In the first place, many of the technologies are still new. It takes time to learn how to use them, and the early attempts suffer from this learning process. Second, production of high-quality educational software is expensive. Some large firms that have the necessary capital to produce educational software hesitate to risk developmental money in a relatively new and uncertain market.

Third, the programers and curriculum experts qualified to produce educational software are in short supply. Finally, some firms cite the lack of adequate property protection—e.g., copyright, patents—for their information products as a barrier to investment in development.

Skepticism About Long-Term Effects.—Some educators are seriously concerned that the long-term effects on learning of substituting technology for traditional teaching methods are not sufficiently understood. While acknowledging that computers or other technologies may have some limited utility in the classroom for drill and practice, or for instruction in computer literacy, they fear that any widespread adoption of technology for education could have deleterious effects on the overall quality of learning.

Cost.—Even though the cost of computer hardware and communication services is dropping, investment in educational technology still represents a substantial commitment by financially pressed schools. Costs of software are likely to remain high until a large market develops over which providers can write off developmental costs. In some cases the cost of information products and services may be passed on to users for the first time.

Policy Issues and Options

Issues

The impact of information technology on education will confront Congress with a number of important policy decisions in several areas:

- *Education and training for economic growth:* OTA found that trends in automation and the growth of the information sector of the economy will probably present the United States with severe manpower training problems over the next decade. These will include a persistent shortage of highly trained computer scientists, engineers, and other specialists; a need for retraining workers displaced by factory and office automation; and a need for a more technologically literate work force. Congress must decide what Federal response to these national needs would be both appropriate and effective.
- *Redressing inequities:* In both the OTA study on national information systems and in this assessment, OTA found concern that a significant social, economic, and political gap could develop between those who do and those who do not have access to, and the ability to use, information systems. People who cannot make effective use of information technology may find themselves unable to deal effectively with their government and to obtain and hold a job. Both social and economic concerns may motivate Congress to take action to improve literacy in American society.
- *New institutional roles:* OTA found that many public educational institutions are under severe strain, to the extent that many question their survival—at least in their current form. Actions directly related to the use of information technology could also have important impacts on these public educational institutions, both by enhancing their productivity and by helping them offer a modern, computer- and communication-based curriculum. Although the States have primary responsibility for control of the public schools, decisions and policies set at the Federal level have influenced the nature of public education and will continue to do so.

Options for Federal Action

Assuming that Congress decides there is a significant need for Federal action to address these issues, there are a number of possible actions it could take.

- **Direct Intervention.**—Congress could take action to increase and improve the use of information technology in education. Most of the following options would principally affect the schools. A few would have a broader effect on the provision of education and training in other institutions.
  —*Provide tax incentives for donations of computers and other information technology:* H.R. 5573 and S. 2281 are examples of such

initiatives. They are intended to accelerate the rate at which schools install computer hardware and to respond to possible inequities in the abilities of school districts to direct funds to equipment acquisition. However, some experts have noted that the personal computer industry is on the verge of moving to a new generation of more powerful machines that may have much greater potential for educational application on a more sophisticated level. Donations of older equipment could freeze the schools into dependency on obsolescent systems. Moreover, such incentives do not address problems such as the need for software, teacher training, or institutional barriers to effective use.

—*Subsidize software development:* OTA found that the most-often cited barrier to current educational use of technology was the lack of adequate educational software. There may be a role for the Government in reducing the risks software producers currently see that inhibit major investment in quality courseware (educational software). Many of the existing successful packages, such as the Sesame Street programs for television and the PLATO computer-aided instruction system, were developed with partial Federal support. On the other hand, good software may be forthcoming if the producers see a sufficient quantity of hardware in the schools to provide them with a viable market.

—*Directly fund technology acquisition by the schools:* The Federal Government could directly underwrite the acquisition of hardware and software by the schools. Such a program would create a market for educational products that would attract producers, and it would accelerate the introduction of technology into the schools. On the other hand, it may promote premature and unwise purchases of technology by schools that are unprepared to use the technology effectively. Such a program is also counter to some current trends and attitudes in Congress concerning the proper Federal role in education.

—*Provide support activities:* The Federal Government could assume a leadership role in encouraging the educational system to make more effective use of information technology by funding demonstration projects, teacher-training programs, and the development of institutions for exchanging information about successful implementations. OTA found evidence of a high degree of interest and motivation by both schools and parents that could be more effectively channeled with appropriate Federal leadership. Such a program would not address the financial limitations that currently prevent many institutions from acquiring technology and software.

- **Adapt a General Education Policy.**—Congress is considering various forms of education-related legislation that may affect, and in turn may be affected by, the new informational needs of society. Examples are bills concerning vocational education, veterans' education, education for the handicapped, and foreign language instruction. Such legislation, if drafted with the intent to do so, could encourage the development of more effective and economical technological alternatives to current programs.

- **Support R&D.**—Federal civilian agency support of R&D in educational technology has decreased substantially over the last decade. OTA found that, to make the most effective use of technology, there was a need for R&D in learning strategies and cognitive development, methods for the production of effective and economical curricular software, and the long-term psychological and cognitive impacts of technology-based education. Congress could consider policies to: 1) directly support R&D in these areas, 2) encourage private sector investment from both foundations and industry, or 3) encourage a combination of both by using Federal funding to leverage private investment.
- **Elimination of Unintended Regulatory Barriers.**—Some legislation and regulation not specifically directed at education may create barriers to the effective application of educational technology. Telecommunication regulation, for example, can affect the cost of technology, access to communication channels, and the institutional structure of education providers.

Moreover, protection of intellectual property, principally copyright law, was identified as a major determinant of the willingness of industry to invest in educational software. The current state of the law was seen by many industry experts as inadequate and, hence, as creating a barrier to the development of novel and innovative software. However, to the extent that such a barrier does exist, it is not clear whether its removal lies in new legislation or in the gradual development of legal precedent in the courts.

NOTE: Copies of the full report "Informational Technology and Its Impact on American Education," can be purchased from the Superintendent of Documents, U.S. Government Printing Office, Washington, D.C. 20402, GPO stock No. 052-003-00888-2.

General Information

Information on the operation of OTA, the nature and status of ongoing assessments, or a list of available publications may be obtained by writing or calling:

Office of Congressional and Public Communications
Office of Technology Assessment
U.S. Congress
Washington, D.C. 20510
(202) 226-2115

Publications Available

OTA Annual Report.—Details OTA's activities and summarizes reports published during the preceding year.

List of Publications.—Catalogs by subject area all of OTA's published reports with instructions on how to order them.

Press Releases.—Announces publication of reports, staff appointments, and other newsworthy activities.

OTA Brochure.—"What OTA Is, What OTA Does, How OTA Works."

Assessment Activities.—Contains brief descriptions of assessments presently under way and recently published reports.

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Health and Life Sciences Division	226-2260
Science, Information, and Natural Resources Division	226-2253
Administration Office	224-8712
Personnel Office	224-8713
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APPENDIX III

ARTICLES

[Copyright Society of the United States (1980), reprinted with permission]
(from 28 Bull. Copy. Soc'y 351 (1980-81))

380. INTERNATIONAL COPYRIGHT IN THE 1980s—*The Eighteenth Annual Jean Geiringer Memorial Lecture*[*]

By STEPHEN STEWART[**]

INTRODUCTION

Thank you for inviting me to deliver this memorial lecture. I consider it a great honour firstly because of the distinguished audiences attending these lectures; secondly because your lecturers have included such eminent jurists as Professor Bodenhausen and Professor Ulmer, such great practitioners of copyright as Erich Schulze and Jean-Loup Tournier, such great public servants as Elisabeth Steup and William Wallace; and last but not least because of the great admiration I have always had for the achievements of Jean Geiringer.

When your former President invited me he asked me with typical generosity to suggest a topic. I chose International Copyright in the 1980s because I believe that the whole copyright system is approaching a crisis and that an analysis of the underlying causes of this crisis may help to overcome it. If I get it wrong there will be many in this audience, and even more outside, to put me right. If, however, the attempt of an analysis fosters an informed debate on how to deal with the crisis the choice will have been justified and, I think, Jean Geiringer would have approved.

Consider that copyright, to be viable in the 1980s, has to be truly international and that international copyright as we understand it is of fairly recent vintage. There have been periods of great flowering of Western civilisation such as the Greek city state, the Roman Empire, the European Renaissance, during which copyright did not exist. There are still many countries today where copyright either hardly exists or where it does not effectively operate. Practical enforcement of international conventions, even in such vital matters as health or sea or air law, is

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[*] This lecture was delivered in the Auditorium of New York University School of Law on November 17, 1980.

[**] Stephen Stewart is a member of the English Bar and a Queen's Counsel. He was from 1960-1979 Director General of IFPI (the International Federation of Producers of Phonograms and Videograms).

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proving very difficult. Consider further that copyright deals with the theft of immaterial or intellectual property which is a concept much more difficult to grasp than ordinary theft and far less deep rooted in the public consciousness of what is right and what is wrong. It is on that public consciousness that all laws and particularly those with a criminal content are based. Convincing the general public even in the great democracies that copyright infringement is theft is a long and arduous process, scarcely begun. Consider finally that technological development in the last twenty-five years has probably been faster and more far reaching than in any previous period of our history. Legislators will have constantly to be persuaded to revise copyright legislation to catch up with technology, when they have been used to doing it only every fifty years and, according to their lights, have "more important things to do." Taking all of this into consideration, you may, before you leave this hall, agree with me that we are entering a crucial period in the development of international copyright. To describe it as a crisis is not alarmist; to treat it as such is merely prudent.

I. The Challenges of the 1960s and '70s

Before analysing the crisis of the 1980s and trying to see how it can be met, I would like to ask quite briefly what the challenges of the 1960s and 1970s have been. I would suggest that they were of three kinds, two of which have been largely met and one of which has not.

The *first* challenge to international copyright in the 1960s and 1970s was the fear that a totalitarian philosophy may negate the whole concept of intellectual property on the grounds that all creative people should find their fulfilment in dedicating their work to the community represented by the state. The state, in return, will look after the artists' material needs. Therefore, in totalitarian countries, individual rights are unnecessary and may be positively harmful. As countries with that sort of philosophy became more common it was feared that the philosophy might spread to other still uncommitted countries and destroy the whole concept of copyright as a private and individual right. Or, it was feared, it would at least gradually reduce the international level of protection.

The U.S.S.R., which was regarded as the original exponent of this philosophy, did not press the attack. And, although the Russian system differs in several material aspects from the patent and copyright systems of the Western countries, the U.S.S.R. has in the 1960s and 1970s joined both the Paris Union and the Universal Copyright Convention. The Russians struck a hard bargain. Since they joined the UCC in its original form and since their ratification was not retrospective, they became entitled to use the whole of the then-existing foreign repertoire without remuneration.

What matters most, however, is that the VAAP, the state-owned monopoly society in the Soviet Union, is building up a network of agreements with foreign collecting societies which are based on copyright principles. These agreements are being meticulously honoured. The fact that the countries of COMECON, with whom the Soviet Union has close trading ties, have old, established and rather sophisticated copyright laws and that these countries were early members of the international conventions has, no doubt, also played a part.

Recent developments in the other major community power, the People's Republic of China, also suggest that the new government of China is not averse to recognising intellectual property rights. Bilateral agreements may be the first step to bringing China into the international copyright community. The day when it may join one of the international conventions is not as far away as it seemed until quite recently.

The *second* challenge to international copyright in the 1960s and 1970s came from the developing countries. This challenge was not based so much on ideological grounds. It was based on the practical proposition that the developing countries needed and welcomed the intellectual property of the western world, but were too poor and certainly too short of hard currency to pay for it in the same way as developed countries did, and further they did not have any copyright material which could readily be offered in exchange. The implied challenge was that if the developing countries could not be accommodated, they might opt out of the international copyright system, at least for the time being. In this case, they would take what they needed without payment, saying that that was, in effect, what the two super-powers had done in the not too distant past.

An attempt to meet this challenge was made at the Stockholm Conference in 1967 and the Paris Revision Conference in 1971. A system of compulsory licences was developed, carefully structured to give mainly to the publishers of the western world an opportunity to meet the needs of developing countries before these compulsory licences come into effect. Although less than a decade is not long enough to judge, there are indications that workable, practical compromises are being found based on this system without actually having to resort to compulsory licences. The untiring efforts of WIPO, the World Intellectual Property Organisation in Geneva, to assist the developing countries in practical ways, and the catalogue of available works established by UNESCO contributed to making a successful solution of these problems in the 1980s and 1990s a practical possibility.

The *third* challenge of the 1960s and 1970s—that posed by rapidly changing technology—has not yet been met. However, the problems posed have been well researched both nationally in several countries and internationally so that the areas where legislative action is necessary have been identified. Possible solutions which should be adopted in the 1980s are emerging. The most important of the problems are (1) reprography, (2) storage and retrieval systems, (3) the illicit extension of the sphere of private copying as a challenge to the reproduction right, and (4) cable and satellite broadcasting as a challenge to the broadcasting right.

The material copied by reprography which is copyrighted material—and a lot of it fortunately is not—consists mainly of literary works and particularly technical and learned journals. Private copying affects mainly musical copyrights and will affect motion picture copyrights as soon as videograms become widespread. Satellite broadcasting and distribution by cable affect a wide group of copyright owners. Although the problems of new technology affect different copyright owners, I submit that the solutions which are emerging have several essential characteristics in common.

In trying to summarise these emerging solutions I shall probably be guilty of several over-simplifications, for which I apologise. I must also, where there are still differences of opinion, give my own—which I am sure you will scrutinize most critically.

II. THE EMERGING SOLUTIONS

1. Computers

After intensive research and debates it has, I think, been agreed that "software", i.e. the computer programme, is a "work" in the copyright sense and should enjoy copyright protection. It has also been agreed that the copyright owner has a right to control the use of *his* work at the input stage. What is still being debated is whether the copyright owner, in exercising his absolute right, can be left to make agreements with the computer users or whether compulsory licencing systems are necessary. However, these solutions have all been debated against the background of the technology of the 1960s. I believe that possibly already in the 1980s or at latest in the 1990s we may see the computer replacing the printing press to a large extent. Then, the user will be able in his office and perhaps even in his home to have a machine linked to a central information store by which he can have extracts or copies made of the works he wishes to use. Bearing in mind that the modern concept of copyright arose largely from the invention of the printing press, even the partial replacement of the printing press by computers would amount to a revolutionary change. The copyright owner will then have to exercise his reproduction right at the input stage and look to the computer disseminator for his royalties in the same way that he has looked towards his publisher in the past. I susggest that when that stage is reached, the burning question of whether there should be compulsory licencing or whether the copyright owners can control this new reproduction right through their societies and bulk licencing will assume a second-rate importance for reasons which I hope to show later.

2. *Videograms*

Videograms have been defined as audio-visual recordings fixed on any form of material support. Under most legislations a videogram will be a cinematographic work, although there is a school of thought originating in French law which takes the view that a mere sequence of images is not necessarily a work. A videogram differs, however, from a motion picture/film because it is intended to be used in the home and not in a theatre and because it will probably be sold as well as hired out. In both these respects it will resemble the phonogram. It is too early to say which material support will appeal most to the public and whether, therefore, videograms will be published mainly as video cassettes or video discs, or both. Video cassettes seem geared mainly to making recordings from television sets and video discs seem to be used with playback equipment, thus offering a wider repertoire at a lower price. If that proves correct, videograms will resemble phonograms in this respect also, using both tape and disc as material support. They will have the same piracy problems as phonograms have had and are still having in some parts of the world and the same problems of private copying, both from borrowed videograms and off the air. The videogram has so far been mainly used in industrial and technical instruction and for educational purposes. When it comes into its own in the entertainment field, it will, having at first used existing material, eventually develop its own art form for audio-visual entertainment and education in the home. The copyright problems it will pose will be those of the phonogram and the motion picture film combined.

3. *"Private Copying"*

This constitutes a serious challenge to the reproduction right. It was originally viewed as an extension to the "private use" exception which exists in most legislations and in the international conventions. But examination of the history and the extent of the private use exception shows that this form of reproduction, although practiced mainly in the privacy of the home and not for commercial purposes, is in fact not an exceptional use but an abuse of the reproduction right. The proviso of Article 9/2 of the Berne Convention, which is contained *mutatis mutandis* in most copyright legislations, lays down that such exceptionally permitted private use must "not conflict with the normal exploitation of the work" or "unreasonably prejudice the legitimate interests of the author." "Private copying" clearly prejudices the authors' interests. On the other hand, it is also clear that this practice has come to stay and that any prohibition or attempt to monitor it would constitute an intolerable intrusion into the privacy of the home. Thus, the only remedy is legislation requiring a royalty to be paid which can be levied either on the recording machine or on the blank tape. If proof was needed that only legislation will solve this problem, the *Betamax* case[1] in the United States has provided it. The attempt to spell out an infringement was made and failed. The court held that private copying of this kind was fair use both under the old law and under the 1976 Act.

There has now been legislation of both types, a royalty on the recording machine in Germany[2] and a royalty on blank tapes in Austria.[3] The two solutions need not be mutually exclusive. As a royalty on blank tapes may be passed on to the consumer, the more substantial the royalty is, the nearer the price of the blank cassette will be to the price of a prerecorded cassette and the less would be the incentive to assemble a library of do-it-yourself tapes. Such a royalty is unusual in two respects. First, it is not paid by the user, i.e. the person copying works in his home, and second, it is a royalty for multiple use. Nonetheless, it should be treated as a royalty for the use of the work and not merely as a compensation for loss or damage to the copyright owners. I suggest that if a choice has to be made, a royalty on blank tapes is preferable. Although multiple use is possible because the private user can erase the recording, this in practice will not be done very often, if at all. On the other hand, recording machines may be used for this purpose hundreds of times. A royalty on blank tapes therefore corresponds more closely to the traditional concept of a royalty for a single use.

Royalties will have to be collected by a collecting society, as is provided in both the German and Austrian legislation. The amount of the royalty can either be laid down in the law or left to collective bargaining between the collecting society and the manufacturers or importers of the tapes. Similarly, the sharing of revenue between the various right owners could be laid down in the legislation or left to negotiations. I venture to think that in both cases free negotiations are preferable. If that solution is adopted, adjudication by a Copyright Royalty Tribunal will have to be provided in case the copyright owners and the copyright users fail to agree.

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[1] Universal City Studios, Inc. v. Sony Corp., 480 F. Supp. 429, 203 U.S.P.Q. 656 (C.D. Cal. 1979). An appeal is pending.

[2] Copyright Act 1965.

[3] Copyright Amendment Act 1980.

4. *Satellites*

Communication satellites are among the most astonishing inventions of modern technology and to see their importance in copyright law in proper perspective, two points have to be made. First, their uses include international telephone traffic, weather forecasting, cartography, agriculture and geology as well as the transmission of programmes, only some of which contain copyright material. The second point is that the main importance of satellites is for their transmission of news and current events, where immediacy is essential. Experience so far seems to show that the main attraction is sports, because the viewer wants to see a sporting event possibly before he knows the result.

The impact of satellite transmitted programmes on copyrights has so far been slight. That is not surprising because such programmes can in most cases be taped and, if sent by air, may arrive within a few hours of the broadcast itself, which would in all but a few cases be in good time.

One must distinguish between "distribution satellites" which operate as vehicles for the transport of signals to broadcasting organisations and, therefore, replace terrestial networks on the one hand and "direct broadcasting satellites" on the other. The latter will transmit on much lower frequencies allocated by international conventions, and the signals are much more high powered and are receivable by members of the public in their homes after an adaptation has been made to their television sets. Someone has called a direct broadcasting satellite "a sort of aerial out in space." That illustrates the legal point that in direct satellite broadcasting, the originating organisation makes the broadcast in the accepted copyright sense by emitting a signal directly receivable by receivers in private homes. I am told that such direct communication satellites may be in service by the mid-1980s. Since the so-called "Satellite Convention"[4] only deals with programmes transmitted by distribution satellites and not with direct broadcasting satellites, it seems technology has overtaken the legal experts. If, as some predict, direct communication by satellite will become the method of ordinary broadcasting for national use in some countries, the protection of programmes received directly from a satellite will in law have to be the same as it is for programmes contained in present day broadcasts. If distribution satellites replace microwave linkages or undersea cables, national legislation will be necessary. In that case, the two model laws worked out under the auspices of WIPO and UNESCO[5] may be very useful.

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[4] Convention Relating to the Distribution of Programme-Carrying Signals Transmitted by Satellite (1974).

[5] E.B.U. REVIEW, November 1979.

However, not many acts of piracy against broadcasters have been reported thus far, and this danger to international copyright may prove not quite as serious as had been feared. Nonetheless, it seems clear that broadcasting organisations will need laws which enable them to control the dissemination of their programmes. Broadcasters will wish to honour their copyright obligations to the contributors to their programmes. If they were unable to control the area in which their programmes are disseminated they would be required to pay for audiences in parts of the world in which they either do not wish their programmes to be received or for which they do not control the rights.

5. *Cable Television (CATV)*

There has been litigation on this subject in several countries and under more than one legal system.[6] Without going into detail, I submit that the following points have been clarified in the 1970s:

a) The distribution of broadcast programmes by cable is aimed at a different public from that reached by broadcasting without cable, otherwise there would be little need for it (although there is often some overlapping). The distinction between the normal reception zone of a broadcast and the zone where a broadcast can only be received by cable has not proved helpful for the solution of the legal problems because cable services have proved financially viable even in direct reception zones and because technological improvements constantly increase the direct reception zones.

b) Whilst broadcasting and distribution by cable are aiming at different audiences, it is now accepted that distribution by cable is a "communication to the public" under the Berne Convention,[7] and the author's right to authorise the communication of his work to the public operates and royalties should be payable. However, most countries still need legislation to protect authors and other copyright owners in this respect.

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[6] *U.S.A.:* Fortnightly Corp. v. United Artists Television Inc., 392 U.S. 390 (1968); Teleprompter Corp. v. Columbia Broadcasting System, 415 U.S. 493 (1974). *Cf.* Section 111, Public Law 94-553, 17 U.S.C. § 111 (1976).

Austria: Supreme Court (Oberster Gerichtshof) Judgment of 25th June 1974 ("*Feldkirch*" case); Supreme Court Judgment of 12th November 1979 ("*Plutonium*" case).

Belgium: Appeal Court (Court d'appel de Bruxelles) Judgment of 3rd June 1969.

Federal Republic of Germany: Appeal Court (Hanseatisches Oberlandesgericht) Judgment of 14th December 1978 (GEMA v. Federal Postal Services), appeal to the Supreme Court pending.

For an analysis of the cases up to May 1978, *see* Dietrich Reimer, 10 I.I.C. (INTERNATIONAL REVIEW OF INDUSTRIAL PROPERTY AND COPYRIGHT LAW) No. 5 (1979).

[7] Article 11 (bis).

c) Problems will arise over the administration of these rights. They must clearly be administered collectively and preferably by one society because of the large number of works involved and because of the practical impossibility of the user contacting all copyright owners before the communication takes place. This situation, however, is not new and at least in the field of musical copyrights has been handled successfully by performing rights societies in many countries. The open question is once more whether national legislators should introduce statutory licencing systems or leave the rights to free negotiation between the collecting society and the users. The group of experts which met under the auspices of WIPO in Geneva in March 1980 recommended that national laws should introduce such compulsory licences only where "administration of these rights (by the grant of voluntary licences) would not work in practice" and then "subject to the right to equitable remuneration and the respect of moral rights".[8] It is perhaps significant that although the Berne Convention in Article 11 (bis) permits member states to enact a system of compulsory licencing to broadcast, according to the secretariat of WIPO, less than a quarter of the 71 member states of the Berne Convention have availed themselves of this possibility. The group of experts also recommends that in respect of cinematographic works and dramatic and dramatic/musical works, non-voluntary licences should be avoided "because the number of right owners is small and they can usually be found without too much difficulty and the time of showing on television must in any event be co-ordinated with theatrical showings for economic reasons". The experts also recommended an equitable remuneration to performers and producers of phonograms whose performances or phonograms are contained in the broadcast and of course recommended that the broadcasting organisations have the right to authorise the distribution by cable of their programmes. I feel sure that these recommendations are sound and that they will appeal to governments. I also venture to think that the recommendation of preferring freely negotiated collective licencing schemes and resorting to statutory licences only where such licencing "would not work in practice" is the right legislative approach, not only for CATV but also for the other situations created by the new technology.

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[8] Statement of the Group of Experts 1/3, *Copyright* (1980), p. 156.

Once a sufficient number of states have dealt with CATV in their legislations, no doubt Article 13 of the Rome Convention, which was specifically drafted to exclude CATV, will one day have to be revised to include it. No other Convention will need amending, although special agreements under Article 20 of the Berne Convention and Article 22 of the Rome Convention may be suitable in special situations, for instance where there is a re-transmission in adjacent countries where the same language is spoken or where several countries jointly use a communication satellite such as the NORSAT scheme for the Scandinavian countries.

In these remarks I have assumed that we are dealing with a situation where a programme unit or a programme is re-transmitted in its entirety. If changes in the programme are made, which is usually the case when deletions or additions or substitutions of advertising material are made, complex legal situations arise which are beyond the confines of this paper.

The following conclusions can be drawn from this necessarily brief synopsis of the solutions which have emerged to the problems of the 1960s and 1970s:

1. There seems no immediate need for the revision of the two major international copyright conventions.
2. National legislation will be needed in most countries to deal with reprography, private copying of phonograms and cinematograph films, and cable television.
3. Compulsory licences may become necessary in some of these fields but should be used only where the "administration of these rights would not work in practice and then subject to equitable renumeration."
4. As in many situations created by new technology, monopolistic collecting societies will face equally monopolistic user organisations. A "Copyright Royalty Tribunal" will thus be necessary to adjudicate in cases of failure to agree on a royalty, whether there is a compulsory licence or not. This will necessitate legislation in those countries that do not yet have such a Tribunal or where the competence of the existing Tribunal has to be extended.

III. COPYRIGHT ROYALTY TRIBUNALS

I would like to say a few words on the concept of a "Copyright

Royalty Tribunal." This will serve as a bridge between my remarks on the proposed solutions to the problems of the 1960s and 1970s on the one hand and the yet-unsolved problems of the 1980s on the other, as I regard such a Tribunal as an essential part of any modern copyright legislation.

The comments I shall make here I first put forward in a paper to the American Bar Association in Montreal in 1966, when the existing Tribunals were few and restricted to specific situations. In Canada,[9] the "Copyright Board" adjudicated the tariffs proposed by the performing rights societies. In Germany,[10] a Tribunal was provided to settle some disputes on royalties but had only vary rarely been used. In the United Kingdom, the "Performing Right Tribunal,"[11] as its name indicates, dealt with licencing schemes and royalty rates for performing rights only, but to that extent was the most viable model. Since 1966, other countries have legislated, e.g. Australia in 1968[12] and introduced Tribunals of various kinds. Most recently, Chapter 8 of the U.S. Copyright Act of 1976 has created a "Copyright Royalty Tribunal."

My main point was then and is now that the fixing of a fair and equitable rate for the use of copyrighted works should in the first place be a matter for negotiations between the parties—the copyright owners and the copyright users. If the negotiating processes are exhausted and the parties cannot agree, it becomes a justiciable issue for a tribunal. It should never be a legislative issue. Parliament is not the right forum for a royalty rate decision as political considerations and the relative strength of lobbies might influence the issue and the result may not be 'fair and equitable.' If it is agreed that there is a justiciable issue, my next point is that a special Tribunal is in a better position to decide it than the ordinary courts. In most cases it can be said that a fair rate for the use of a copyright is the lowest amount a reasonable copyright owner would accept and also the highest amount a reasonable user would pay. The adjudication therefore requires the weighing both of arguments about the philosophy of copyright and of arguments of a commercial kind. The best Tribunal for such issues, in my submission, is a professional judge as chairman to preside over the procedure and decide points of law and two or three fair-minded and knowledgeable laymen as members. I would submit that you get the best results if the Tribunal deals both with cases where the copyright owner has an absolute right, e.g. the performing right of the author, and also with cases where the right is subject to a compulsory licence, e.g. the recording right. When a Tribunal has heard a number of cases on the licencing of a particular right, a "going rate" emerges and the parties know approximately what they can expect and that reduces litigation. I also submit that if the same Tribunal hears cases relating to absolute rights and cases relating to rights subject to a statutory licence, it will probably in its findings apply the same criteria of what is 'fair and reasonable' to both situations. If it does, one of the main objections of copyright owners against some statutory licence systems may disappear, as it will be realised that whether the copyright owner has an absolute right or a right to equitable remuneration the rate would, if there is disagreement, ultimately be decided by the same Tribunal according to the same criteria and presumably with the same results.

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[9] Copyright Act 1952 section 50.

[10] Copyright Act 1965 Regulations on the Arbitration Commission 1965/70.

[11] Copyright Act 1956 sections 23-30.

[12] Copyright Act 1968 section 136 ff.

I submit that another issue which should go to the Copyright Royalty Tribunal in cases of disagreement between the parties is the proportion of sharing of revenues between copyright owners, e.g. when the makers of blank tapes for "home taping" have paid lump sums which have to be distributed between different right owners.

During the 1980s, when we shall have had experience with such Tribunals in several countries, some ground rules for such Tribunals will emerge. The subject could also greatly benefit from an international in-depth study by independent experts. Apart from the nature, the range of jurisdiction and the constitutional position of such Tribunals the subject of the study should extend to such vital questions as the appointment of the members of the Tribunal, particularly the Chairman, the rules of procedure suitable for such Tribunals, and the right of appeal from the Tribunal to the ordinary courts on points of law. Such a study, together with the experience gained in the common law countries, mainly the United States and the United Kingdom, would be of the greatest value to countries wishing to legislate on copyright and considering introducing Copyright Royalty Tribunals of one kind or another.

IV. OTHER PROBLEMS OF THE 1980s

Having dealt with the problems posed by advanced technology and the solutions proposed to be adopted in the 1980s, let me now turn to the other problems which, as I see it, characterise the crisis of the 1980s: The first of these crises is the loss of control over the work by the right owner, particularly the individual right owner. The second crisis is the trend towards collectivisation of royalties. And the third crisis is the political tendency in the industrialised societies which often militates against copyright as an allegedly monopolistic property right. This I shall call "Consumerism."

1. Loss of Control

There are two facets to the control problem. The first, which I have already touched on, is that compulsory licence systems are on the increase and that even some of the absolute rights can only be exercised through bulk licencing by large collecting societies. The second facet of the problem concerns enforcement procedures. These will have to be constantly improved and refined if pirates and large scale infringers are not to undermine the control of copyright owners over their works and considerably reduce the copyright owners' incomes.

It has been acknowledged for a long time that some copyrights can only be exercised through a collecting society. What is new, however, is that more and more copyrights come into this category. As we have seen, most of the solutions to the technological problems not only predicate a collecting society but the laws of some countries provide that these rights can only be exercised through a collecting society. In some cases, the laws even provide that the rights can only be exercised through a single collecting society. This places both a heavy technical burden and a great moral responsibility on these societies. Happily, the modern technology which poses these problems also provides some solutions. Having seen the most efficient ones in operation, I feel confident that they can carry the additional burdens. I also feel that it may well be that the more rights the collecting societies administer, the more fully they can use their technology, enabling them to become more cost effective and to keep the charges to their members lower, thus increasing the incomes of copyright owners.

The creation of collection and distribution systems which can be used by a *group* of countries should also be explored. An example of an existing multi-national society is the NCB (Nordic Copyright Bureau) which collects and distributes for Denmark, Sweden, Norway and Finland. The problem of deciding which of the existing societies should become the centre and provide the multi-national service is not a technical one but a political one.

I can only touch briefly in this context on the moral and social responsibility of the collecting societies. Since the invention of the printing press there have been centuries of a system of patronage for authors and privileges for booksellers and then almost two centuries of a direct, very personal relationship between authors and the successors of the early booksellers, the publishers. In many spheres of copyright, collecting societies are now being superimposed on this relationship and in some countries they also exercise some of the functions of a labour union. It has always been essential to copyright owners that these societies should be highly efficient. It will be vital in the 1980s that they should also be the standard bearers of the ideals of authorship. Barbara Ringer has outlined the problems of individual authorship admirably in her Donald Brace lecture in 1976.[15] I would like to echo her feeling that the discussion of this problem should not be confined to lawyers or to businessmen such as publishers or film or record producers or the representatives of the information industry—it should be carried on with the active participation of the creators themselves. We should remember that the first society of writers was inspired by Victor Hugo and the first important society of composers by Richard Strauss.

Perhaps the most important practical means by which copyright owners can maintain or regain control of their rights is a radical improvement of enforcement procedures. The main areas which will need attention are summary procedures and penalties.

Taking penalties first: A 10% inflation rate per annum which, alas, is not uncommon in the 1980s, reduces a penalty provided by law to about half in just over four years and to a quarter in just over six years. This is, of course, a problem affecting all fines imposed as sentences for crime, but it is particularly serious in the copyright field for two reasons. The first is that in the democracies, Parliaments only found time for copyright revision on average every fifty years, and by then these penalties become derisory. Italian law provides a good example. The copyright law was passed in 1941 and certain penalties were revised in 1980. During the intervening years the value of the lira had dropped to a small fraction. The problem is shown in its acutest form in countries with a 50% inflation rate like some Latin American countries or even in excess of 100% like Israel, when penalties cease being effective after a few years.

The second reason that penalties are a grave problem in the copyright area is that for copyright infringements, as opposed to other offences, fines have until recently been the only penalty imposed. This is because the courts in most countries are very reluctant to impose prison sentences for offences which the man in the street and in some cases the judges do not regard as "real crimes." To choose a recent example from Hong Kong: A record pirate employing five or six operators and up to a hundred tape recording machines in a four- or five-room flat could, a few years ago, have made a million dollars in a year.

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[15] Ringer, *Copyright in the 1980s - The Sixth Donald C. Brace Memorial Lecture*, 23 BULL. COPR. SOC'Y 299 (June, 1976).

If he were caught, he would pay the highest fines the courts could impose out of the petty cash. Judges in serious infringement cases are thus faced with Hobson's choice. They can either impose fines which they know to be no deterrent and sometimes derisory or pass prison sentences which for a variety of reasons they are reluctant to do, certainly in the case of first offenders. I need not tell this audience that to persuade the law enforcement agencies and the courts that copyright piracy is a commercial crime of a major order which can only be curbed by the imposing of prison sentences in serious cases is a major task of education and advocacy which may take many years. Yet these major efforts of education will have to be made by many copyright owners in many countries in the 1980s if their copyrights are not to be seriously eroded.

The other area where enforcement procedures need strengthening is the area of interlocutory relief, particularly injunctions and orders for search and seizure. Whereas penalties can only be increased by Parliaments and prison sentences only imposed by judges, the vigilance of copyright owners and the ingenuity of copyright lawyers can often bring about the desired results in this field without statutory law reform. Two examples from Europe will illustrate my point:

It is often essential to the Plaintiff's case against an infringer who is believed to have infringing articles in his possession to inspect such articles. Inspection has the double purpose of preparing the Plaintiff's case and of restraining the Defendant from making or distributing further infringing copies. If the Defendant is given notice in the usual way of an application to the court for an inspection order, he is likely to dispose of the articles or of the relevant documents. In fact, in cases against record or tape pirates, whether brought by the author or by the phonogram producer, this was almost invariably the case. However in England, in the case of *Anton Piller K.G. v Manufacturing Processes,*[14] the Plaintiff obtained an order for inspection including the photocopying of all relevant documents and delivery up of all relevant articles. The application, which is now standard practice, is made *ex parte* and *in camera*. The first the defendant hears of the order is when it is served on him by the Plaintiff's solicitors at the premises to be inspected. The Plaintiff's representatives cannot force the Defendant to let them enter for the inspection but the Defendant may be in contempt of court if he refuses entry. This is explained to him and in fact entry is hardly ever refused. The order is only granted when the Plaintiff has a very strong prima facie case and where there is "a grave danger that vital evidence will be destroyed. . . . and so the ends of justice be defeated." In the large majority of cases the Defendant submits to judgment with costs, thus saving a great deal of judicial time and expense. The effect is probably as close as one can get to a search warrant in a civil case. The scope of the order goes beyond piracy of phonograms and of copyright cases generally and has been obtained regularly since 1976 both in the U.K. and in other Anglo-Saxon jurisdictions. It is an example of how copyrights can be protected by making case law and without having to ask for special legislation. In several countries, courts have been sympathetic to procedures of a similar kind if it can be shown that there is imminent danger the infringing articles will taken out of the jurisdiction.

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[14] 1976 Ch 55.

Another case of imaginative use of existing remedies by copyright lawyers comes from Italy. In the last year there have been four reported cases in the Italian courts, including one in the Appellate Court,[13] in which shopkeepers who sold infringing articles were convicted as receivers of stolen property. If a court can be persuaded that intellectual property is 'property' and that therefore infringing copies are "stolen goods," the copyright owners have gained two decisive advantages. The first is that penalties are far heavier since courts show as a rule less reluctance to impose prison sentences on receivers if the amounts involved are large. The second advantage is that the burden of proving guilty intent, i.e. that the defendant knew that he was handling infringing copies, is less heavy in most countries. In many countries, the burden of proof is reversed, i.e. once it is proved that the property was stolen property, the defendant has to show that he did not know it was stolen property. That means in copyright cases that he must prove that he did not know that the copies he was handling were infringing copies.

2. *Collectivisation of Individual Rights and the Creation of Rights Outside the Copyright System*

The danger of collectivisation of individual rights arises from the loss of control of the copyright owner over his work. This danger is present both in freely negotiated situations with blanket licences and a clearing house system, and in compulsory licence situations. It will have to be seen clearly and analysed in order to be met. Some examples may elucidate my point.

In any collecting society there are, after the most meticulously carried out distribution, substantial sums which cannot be allocated to a right owner and are classed as "undistributable." There are basically two ways of handling this situation, although there may be several variations on each of the two. One way is to distribute these amounts by working out the relation of the undistributable total to the grand total of income and then adding a percentage as a "bonus" to the receipts of each copyright owner. The other way is not to distribute these funds but to use them for social purposes which may range from pensions for elderly members or their widows to educational support for the young. The main criticism levelled against this "social" method is precisely that it is a form of collectivisation of individual rights. The main criticism of the "bonus" method is that it is giving to the "haves" and not giving to, or possibly taking from, the "have nots." The problem gets even more acute when you have a situation where a substantial proportion or all the revenue collected cannot be individually allocated. Examples in the field of public performance revenue for musical copyrights are royalties collected from juke boxes or discotheques or from radio stations which cannot be persuaded to supply lists of the works used.

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[13] State v Salvatore Molinari and Antonio Moccia, Court of Appeal of Naples No. 4239/79 of 11 April 1980.

An example of collectivisation that seems to be acceptable in the social and political climate of the country is the "Fund Law" of 1956 for Neighbouring Rights in Norway. All public performance users of phonograms and broadcasters are paying a royalty into the Fund for the use of these phonograms. The committee of the Fund decides first on the share which goes to the different right owners, in this case record producers and performers. The share of the record producers is paid to their organisation and distributed as far as possible according to copyright rules. The share of the performers, on the other hand, is distributed to individual musicians and their families, not according to playing time or any other copyright principles, but according to the musicians' financial need.

The problem has existed in the fields of both copyright and "neighbouring rights" for over a quarter of a century and has sometimes been hotly debated. But it will loom much larger in the 1980s as funds will be flowing into collecting societies through blanket licencing and international clearinghouse systems from sources which make them almost by definition difficult to distribute according to copyright rules. The royalty on blank tape for the "home taping" of phonograms is an example. Royalties for the copying of literary and scientific works in public libraries may be another. The problem does not become any easier to solve by the fact that any solution has social and political, as well as legal, implications. All one can say within the framework of this paper is that from a copyright point of view, either the "social" or the "bonus" system sketched out above or a combination of both or indeed any other method of distribution would be acceptable, provided most right owners are members of the collecting society and the decision is democratically arrived at within the membership of the society. However, this only highlights the problem, as can be readily appreciated by anyone who knows how difficult it is to ascertain the collective will of a large membership with very diverse interests.

Another side of this problem is posed by the new rights arising from technological change: they can be conceived as copyrights, but need not necessarily be introduced as copyrights at all. The "public lending right" or the royalty on recording equipment or on blank tapes for "home taping" may serve as examples.

The impost on recording equipment or blank tapes is a copyright royalty in the sense that it remunerates copyright owners for the use of their works. However, it is, as I pointed out earlier, unorthodox in the sense that the royalty is not paid by the user, i.e. the private person copying a work, but by a third party, the manufacturer or importer of the equipment or the tape. Both the impost on the equipment under German law and the impost on blank tape under Austrian law are conceived as copyright royalties and distributed as such. But it is quite possible to conceive such payments as a kind of levy or tax imposed by the government and distributed in accordance with social or cultural principles for the benefit of the profession adversely affected, a method the French government at one stage wanted to adopt, but was persuaded to abandon.

The public lending right in the United Kingdom is contained in a separate Act of Parliament, the Public Lending Right Act 1978, and is not conceived strictly as a copyright royalty. The payments to authors are not made by the user, i.e. the borrowers of books from public libraries. These provide a free public service, the cost of which is funded out of taxation. The payments to authors are made out of a special government fund voted by Parliament. The fund will however be distributed on the basis of copyright principles, i.e. based on the frequency of the use of the work, by the lending of books.

On the other hand, in Sweden and in Germany the public lending right (PLR) is conceived as a copyright, it is dealt with in the copyright law and the funds are distributed according to copyright rules. One of the consequences of this distinction is that if PLR is conceived as a copyright, the revenue is subject to the international copyright conventions. Thus, foreign right owners will participate according to the principle of national treatment. However, if the right is not conceived as a copyright, the revenue can be shared among nationals only. This is politically defensible if the funds come, as in the United Kingdom case, out of tax-payers' money and not from the users of copyrighted works. When the PLR scheme in the United Kingdom comes into operation, it appears to be intended that there will be agreements with foreign collecting societies on the basis of reciprocity. This means that foreign authors will be paid out of the United Kingdom fund if the author is a national of a country where PLR exists and where United Kingdom authors are paid when their books are borrowed from public libraries. As more countries introduce PLR and, therefore, more reciprocal agreements are made, this may eventually lead to authors being paid for much of the use of their works abroad and a satisfactory international result may thus eventually be achieved by stages.

On the other hand, if in several countries some of these newly created rights are conceived outside the copyright system, the effectiveness of the international copyright conventions may be seriously undermined. It would be beyond the scope of this paper to deal with possible solutions. I would suggest however that serious thought be given by international copyright lawyers in the 1980s to the possibility of framing these new rights in such a way as to retain them within the ambit of copyright, and distributing the revenues according to copyright principles while at the same time enabling the legislators to overcome political objections to a solution which would allow some foreign right owners to scoop the pool without any flow of funds back to national authors. The problem is not new in international copyright; it is merely an old problem posed in a new form. It is interesting to note in this context that when the Brussels Revision Conference of the Berne Convention in 1948 created a "droit de suite" for works of art, it applied to it the reciprocity rule rather than the general rule of national treatment, probably with similar considerations in mind.

3. *Consumerism and Anti-Trust Law*

The next challenge is one which goes to the very root of copyright. It is a doctrine which is not new but which assumed much greater importance in the 1960s and 1970s and will, I fear, gather strength in the 1980s as the economic recession develops. It is known as "consumer politics." Applied to copyright, the doctrine means that the consumer should have the widest possible access to all copyright material at the lowest possible cost and, in many cases, free. Almost everybody in our modern society is a consumer of copyrights in several respects: as a reader of books, newspapers, or other printed copyright material, as a listener to music, as a viewer of television or as a parent of a child at school who should have his school books cheap or free, to name only the most common uses. Thus, put in electoral terms, on most copyright issues the overwhelming majority of voters are on one side and a comparatively very small number of voters, who are copyright owners, are on the other side of the argument. Furthermore, only a tiny fraction of this small number of copyright owners become millionaires, but it is those few who are constantly in the public eye. No politician, even if he is the opposite of a populist, could totally ignore this when taking a position on a copyright issue. The counter-argument, as you all know, is that without copyright, the liberty of the subject, including the liberty of speech and the freedom of expression in literature and the arts, would be in danger and ultimately some of the values of western civilisation would be at risk. But this counter-argument is not as obvious as the popularist argument of cheap access to copyright works by the general public. Therefore, the copyright argument needs to be put again and again in differing forms and in all countries. Once this is acknowledged, the task of constantly arguing for the maintenance and development of copyright, which may at times appear repetitive, or even tedious, becomes a necessary, even a noble pursuit, humanist in the best sense of the word.

The same challenge is presented by some anti-trust laws. Anti-trust laws are a strange mixture of legal principles and economic and political considerations. The mixture varies according to the economic necessities of the country in question or sometimes according to the political philosophy of the government of the day. Copyright is sometimes looked upon in this context as a monopoly twice over—first because it is a bundle of rights monopolistic in their nature and second because it is increasingly exercised through societies which represent most of the copyright owners and have, therefore, by definition market-dominating positions.

The first part of the above proposition is false; the second is correct. Copyright does not prevent anyone from making the same product as the copyright owner, writing a book or a song or making a film or a record, and subject only to the laws on plagiarism, even a very similar book or song, etc.; it only prevents people from slavishly copying the right owner's work. This distinction is clear enough to copyright lawyers but unfortunately is not well understood by others. It will have to be restated again and again to politicians and to the general public in country after country if copyright is to develop on effective lines.

The second part of the proposition is correct. Most collecting societies have market-dominating positions. This will have to be defended on very practical grounds. First, many copyrights cannot be exercised by any other means. But further, the system is of considerable benefit to users, who are thus legally secure in negotiating one bulk licence for whole repertoires with one society instead of having to find a large number of copyright owners.

I am encouraged on this point by the treatment of copyright in the European Economic Community. Perhaps I ought to preface my remarks by pointing out that the EEC approach to anti-trust, although inspired by U.S. legislation, differs from the U.S. approach. Article 85 of the Treaty of Rome, like section 1 of the Sherman Act, is a general prohibition of agreements which restrict competition. It also gives, like the Clayton Act, examples of prohibited activities such as price fixing, etc. On the other hand, section 3 of Article 85 creates an exception for agreements and concerted practices which contribute to promoting technical and economic progress while allowing consumers a fair share of the resulting benefit and which do not impose unnecessary restrictions. Article 86, contrary to section 2 of the Sherman Act, does not prohibit monopolies or market dominating positions 'per se', it only prohibits the "abuse" of such a position and the Commission has to show in each case that there is such "abuse." Thus the effect of the exception of Article 85/3 and the "abuse" concept of Article 86 constitute what has been called "a built-in rule of reason."

The European Court first dealt with copyright in the form of the right of record producers, which is classed as a "neighbouring right" in several member states, in the case of *DGG v Metro* in 1971.[16] Since then the European Court has dealt with copyrights as well as patents and trade marks in a long series of judgments which I cannot analyse here. What they seem to be saying to copyright owners as well as other intellectual property right owners, albeit not in such simple language, is, "We know you have an exclusive right exercisable over a very long period. We also know that in many instances your rights are exercised by monopolistic collecting societies. We do not object to that, as long as you and the societies who act on your behalf do not abuse that position." What is and what is not an abuse is a matter of degree and is to be judged in the circumstances of each case.

The Commission of the EEC dealt with the collecting societies mainly in the field of musical copyrights and forced some alterations in their statutes, but it accepted the necessity of one collecting society per country. The collecting societies within the community have continued to operate successfully under their revised statutes.

Lastly, new national laws passed since the Treaty of Rome have provided that new rights given to copyright owners are only exercisable through a monopolistic collecting society. Article 53 of the German Copyright Act of 1965, creating the royalty on reproduction equipment, and the Copyright Amendment Act of 1980 in Austria, creating the royalty on blank tape, are examples.[17]

Thus, the Commission as the main executive organ of the Community, the European Court as the judicial organ and the Parliaments of the states are all coming to terms with the relationship between copyright law and anti-trust and restrictive practices legislation. I submit that the European experience shows that they are terms which modern copyright owners can live with. I would expect that the experience of the last two decades in the EEC will be repeated in the 1980s in other countries in varying forms. This means that the concepts of copyright and anti-trust law can co-exist but the frontiers of copyright and the effective exercise of international copyright will have to be defended in the courts by copyright lawyers in many countries throughout the 1980s.

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[16] Deutsche Grammophon Gesellschaft m.b.H v. Metro- S.B. Grossmarkte G.m.b.H. & Co., CMLR 361 (1971).

[17] Austria is not a member of the Community but has an affiliation treaty which imports the EEC competition rules into Austrian law.

These then are the challenges of the 1980s. What are the forces to meet these challenges? They are mainly copyright owners themselves, their champions, and those governments concerned with the preservation of authorship in its widest sense as a natural resource. I will deal with the role of government first.

V. THE ROLE OF GOVERNMENT IN COPYRIGHT

It is a truism that the development of copyright necessitates the involvement of government as it is a creature of statute at the national level and of intergovernmental conventions at the international level. Copyright owners therefore ignore the role of government at their peril. Yet the relationship between copyright owners and government in most countries has innate difficuluties.

On the national level in parliamentary democracies, for reasons which I have referred to before, there are no votes in copyright. As a result, in the leading countries comprehensive copyright revision has in the past taken place at intervals of almost half a century: In the United States 1909 to 1976, in German 1909 to 1965, in the United Kingdom 1911 to 1956, in France a century and a half from 1791 to 1957. In a period of rapid technological change this is far too long. I have tried to show earlier in this paper that in the 1980s all major countries will need some copyright legislation or a revision programme if solutions to the problems posed are to be adopted. This will need resolute and concentrated efforts by all copyright owners vis-à-vis government. It may well be that these efforts will only be successful if they are made by all the copyright owners jointly. I shall, if I may, revert to this proposition later.

On the international level the difficulties are considerable. Having observed the reaction of governments to international copyright problems over nearly twenty years, I suggest to you a formula to describe their attitudes to international conventions. A government will ratify an international convention if:

$$E + NPg = I$$

"E" is the total of the country's exports of copyrights and "I" is the total of its imports. "NPg" is the national prestige attached to the export of the works of national authors. Such works represent a nation's culture heritage, as well as its spiritual aspirations. They are, in a sense, the nation's very own contribution to the cultural achievements of mankind.

One must bear in mind that in most countries imports of copyrights exceed exports. Such countries will thus only ratify a convention if the government is of the opinion that adding the national prestige to the value of exports will balance the import bill. The significance of this equation and part of its fascination is that whereas "E" and "I" should be ascertainable figures, "NPg" is always a matter of personal judgment. It can be defined as the gain to the country derived from the appreciation of its cultural and intellectual achievements abroad. Thus, the main variable in the equation is not measurable, but a matter of judgment by the government of the day or sometimes by eminent persons representing and committing governments at the international level. In this situation the scope of imaginative advocacy when putting the case for copyright owners is very considerable. Success or failure may sometimes depend on the quality of that advocacy.

Although, as I have tried to show, the major task for copyright owners in the 1980s will be to achieve national legislation, there are international challenges as well. I suggest that the 1980s should see the long delayed ratification of the Berne Convention[18] by the United States. When Professor Bodenhausen gave the Geiringer lecture on this subject in 1966[19] he listed three major difficulties: the manufacturing clause; the term of copyright, life plus fifty years; and the formalities. The difficulty over the term of copyright has already disappeared. The difficulty over the manufacturing clause will have disappeared by January 1, 1982. Thus, only the difficulty of formalities remains, and this had been regarded as the least formidable of the three obstacles. Bearing in mind that the members of the Berne Union want the United States to ratify the Convention and bearing in mind that it is in the interest of the United States as one of the largest exporters of copyright to ratify the Convention with the highest level of protection, it should not be too difficult to overcome this last hurdle. There are various possibilities: the suggestion of a separate protocol inserting the Universal Copyright Convention formalities clause[20] into the Berne Convention is one of them. An in-depth study undertaken by American experts would show the comparative merits of the alternatives and facilitate the choice. If this ratification can be achieved, the major copyright countries would be members of both Conventions. Then, a two-tier structure, with the Berne Convention as the upper tier and the U.C.C. as the lower tier, will emerge. A fusion of the two secretariats, with WIPO as the special United Nations agency, will then become possible with savings in manpower, effort, time and money which are obvious. The ratification by the United States would be a most fitting way to celebrate the centenary of the Berne Convention which occurs in 1986. I submit that we should all work towards this goal.

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[18] Berne Convention for the Protection of Literary and Artistic works (Paris Act) 1971.

[19] Bodenhausen, *United States Copyright Protection and the Berne Convention*, 13 BULL. COPR. SOC'Y 215, Item No. 258 (1966).

[20] Universal Copyright Convention (Paris Act) 1971, Article III.

Of the other international conventions in the copyright field, the Rome Convention may become ripe for revision in the 1980s when what seems to be the traditional 25-year period since the making of the Convention will have elapsed and membership will probably have reached the magic figure of thirty. A revision of the rights of broadcasting organisations, particularly in the field of cable and satellites, to which I have referred, would make the Convention more attractive to the broadcasting organisations whose opposition to it for the first fifteen years of its existence had prevented its ratification in a number of states. The considerable pioneering effect which the Convention has already had in the field of so called "neighbouring rights" is evidenced by the fact that over fifty states have legislated in this field since the Convention was concluded in 1961.[81]

VI. THE ROLE OF COPYRIGHT OWNERS

To deal with copyright in the 1980s without dealing with the new role of the copyright owners would indeed be trying to stage Hamlet without the Prince of Denmark. The first question is: Who are the copyright owners of the 1980s? They are, it is submitted, all copyright owners, old and new, from the traditional mainly individual copyright owners of the nineteenth century to the new and mainly corporate copyright owners of the twentieth. The distinction between "copyright" owners and "neighbouring rights" owners was adopted in the 1940s and 1950s at the international level largely to accommodate the French and some other legal systems which are based on "authors' rights" (droits d'auteurs) rather than "copyrights." This distinction is, however, not very meaningful in Anglo-Saxon or common law-derived jurisdictions where motion picture producers, phonogram producers or broadcasting organisations are copyright owners. The only distinction, I submit, which will stand up to critical examination is the one between copyright owners who are physical persons and copyright owners who are companies or corporations, a distinction which is most important when considering moral or personal, rather than economic, rights. Another common feature of the new copyright owners, apart from their corporate status, is that they are, increasingly, both right owners *and* right users. This sometimes produces schizophrenic attitudes because, looked at from a purely commercial point of view, their tendency would be to pay as little as possible for the rights they have to buy and to get as much as possible for the rights they sell. It is in my view very important for the successful development of copyright that they should be encouraged in every possible way to resolve this conflict by behaving more and more like copyright owners.

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[81] ILO/UNESCO/WIPO ICR/SCT/TMP/2 para 72 ff.

It is perhaps paradoxical that apart from the most valuable work done by some copyright lawyers, a major contribution in this respect was made by the pirates. The old copyright owners realised towards the end of the nineteenth century that they needed strong and internationally exercisable rights. The new right owners reached this position comparatively recently. The history of copyright piracy in the 1960s and 1970s is instructive in this respect. The record producers were the first to be attacked by an enemy from outside. They reacted by using copyrights in their defence where they had them, and acquiring such rights by new legislation where they did not have them, particularly in the United States, Japan and Latin America. Although piracy can never be totally eradicated any more than ordinary theft can, in most industrial countries record piracy has been fought successfully and is being contained. There are still large parts of the world, mainly developing countries, where record piracy is rampant and the fight will have to continue in the 1980s. It has been shown that this is where international conventions can pave the way. The Phonogram Convention,[22] which was agreed upon within eighteen months of being proposed and ratified in less than ten years by over thirty countries, among them all the major markets, shows that the governments of the world can be responsive to the plight of copyright owners in a crisis if their help is enlisted with convincing arguments and at the psychological moment—"There is a tide in the affairs of men. . . ."

The oldest of the corporate copyright owners, the film producers, were attacked next and film piracy is today a serious problem. Film producers are protected by the Berne Convention and by the Universal Copyright Convention and by nearly all national legislations. They are beginning to react and organise their defences. Their severest test will come when videograms and the equipment to copy them will come on to the market at prices which a substantial proportion of householders in the industrialised world can afford. This is likely to happen in the 1980s. Film producers will then be in the same position as record producers were in the 1970s except that their rights are already firmly established. They therefore start with a great advantage. Their enforcement problems, however, will be similar to those of record producers.

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[22] Convention for the Protection of Producers of Phonograms against Unauthorised Duplication of their Phonograms, 1971.

Broadcasting organisations have been large copyright owners of audio-visual material for some time. Co-production with film companies and sometimes record companies, and the opening up of the videocassette market, will put them too in the front line of the defence of their copyrights. They are also large users of copyrights, perhaps the largest single user, as well as copyright owners. Direct satellite broadcasting will make them vulnerable in both capacities.

The new, mainly corporate, right owners discovered their position and their "noblesse oblige" function in copyright only slowly and sometimes at the eleventh hour. The traditional copyright owners, mainly through their societies, were not entirely free from blame either. Some of them have, in the 1950s and 1960s, acted in the sincere belief that the best way to defend and enhance their members' copyrights was to deny rights to others who are actual or potential right owners. I submit that this is a tragic fallacy. It is an essential difference between a vendor and a licensor that, whereas the vendor has no interest in the legal position of his purchaser as long as the latter can raise the purchase money to pay him, the licensor has a vital interest in the strength of the legal position of his licensee. The stronger the latter's legal rights, the better he will be able to defend both his own rights and those of the licensor. Composers and music publishers found in the 1970s when piracy of phonograms became rampant that, in countries where record producers' rights were weak or non-existent, the pirates swept the market and authors and publishers lost a large slice of their royalties. On the other hand, in countries where the record producers' rights were strong and, particularly in the countries where all copyright owners joined forces, piracy was brought under control more quickly and authors' royalties were safeguarded. By the same token, I submit that in the 1980s, when videograms will be used in private homes in large numbers and direct satellite broadcasting becomes a reality, the rights of videogram producers and broadcasters will have to be strengthened as they will be in the front line of the attack by the pirates.

At this stage, a look at the historic development of the corporate right owners, who are sometimes loosely called "media," may be appropriate. It will show that with advancing technology they have moved towards each other in the past and that they may in certain respects become indistinguishable in the 1980s. Motion pictures started as silent "movies" and later added sound, whereas broadcasting moved in the opposite direction, starting as sound radio and adding pictures to become television. Records, which were the sound-only-medium par excellence, are now becoming audio-visual with the creation of videograms. The result of this for the public of the 1980s will be that most entertainment and a good deal of education and information will be audio-visual. The main difference between these "media" will be that some audio-visual entertainment as well as information will take place in public and some will take place in the home. This constitutes an important shift in the dividing line. From the point of view of the creators, this means that their creations will be disseminated to the public in several forms. Provided they can control their copyrights, the creators may even be able to plan the sequence. A creator may, like a wine grower, reserve his "premier cru" for a video disc, his second "release" for pay-television, his third "edition" for a motion picture and his fourth for ordinary television. I have deliberately mixed my metaphors to make the point that the creators will have separate sources of income if they can control their copyright, whereas from the consumer's point of view all the "media" will compete even more closely than before for his attention, his spare time and his money.

I suggest that numerically the consumers of copyright will keep growing in the 1980s. In the industrialised countries, the age span of each consumer is still growing as people earn earlier and live longer. Working hours continuously shorten and leisure hours increase. The 4½ or even four-day week may seem far away but it may be no further than the two-day weekend was in the 1930s.

However, while the actual number of consumers of copyright will probably continue to increase in the 1980s, their individual purchasing power is probably going to decrease with the recession, at least in the first half of the decade. This is a very significant factor. While the expansion in international copyright, both in the content of rights and in the volume of revenue, in the 1960s and 1970s was far beyond expectations, this occurred against a background of rapidly increasing gross national product and volume of world trade. A defence of these gains in the 1980s will have to be mounted against the economic background of slower growth of national product and a slowing down of world trade. Time for organising the defences is short. I will only mention two practical steps which may be helpful. I would like to see a "Committee for the Defence of Copyright" set up as a matter of urgency, in which all groups of copyright owners, individual and corporate, old and new, should be represented. Such a committee should be concerned with coordinating defence policies in the major markets and on the international level, and with the pooling and husbanding of resources for the defence of copyright which, particularly if left until rather late, can be a costly business.

It may be argued that such co-operation will be impossible to achieve while in some of the most important markets lawsuits were being fought between some of these parties. I do not share this view for two reasons. The first reason is that such proceedings are now more often not before the courts but before the various Copyright Royalty Tribunals. They eventually lead to the establishment of a "going rate" which make further litigation unnecessary and cause the bruises to heal more quickly. The second reason is that I believe that there is nothing more conducive to peace between two contesting parties than an alliance born of the necessity to defend their respective rights against a common danger. Working together for a common economic as well as moral interest and against common enemies will foster an understanding of each other's position which has often been lacking in the 1960s and 1970s. Based on such an understanding, the whole climate of the relations between different copyright owners would change dramatically.

I would not deny that such an alliance of all right owners in defence of copyright once created may have its teething troubles, but without it the defence in the 1980s of the levels of international copyright protection which we have attained would be very difficult indeed. On the other hand, the moral and economic influence such an alliance would have on governments may prove strong enough to offset the tendencies militating against the development of international copyright which I have outlined.

One would also like to see the lawyers interested in international copyright add to the contributions some of them have made individually by a corporate contribution to the development of copyright in the 1980s. This could perhaps be achieved through a body which would have a similar function in the copyright field to that of AIPPI,[23] the international association for the protection of industrial property in the international patent and trademark fields which was formed in the 1950s and 1960s. Such an organisation would add a valuable private dimension to the outstanding contribution to international copyright which WIPO has made as an inter-governmental body in the 1960s and 1970s under the leadership of Professor Bodenhausen and Dr. Bogsch.

Ladies and gentlemen, the stakes are high. Success may mean that international copyright may reach its highest promise. By that I mean not only intellectual freedom for creators but also economic independence in the sense that successful creators may, perhaps for the first time in our history, be able to take their rightful place among the ranks of other intellectual workers by earning a satisfactory living from their craft without looking either to the state or to other institutions for assistance and without having to take a second job to survive. Nothing short of this should be our aim.

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[23] Association Internationale pour la Protection de la Proprietée Industrielle.

On the other hand, failure may mean a gradual erosion of the international copyright system built up over the last 100 years. I hope to have shown that a good deal will depend on the unity, the wisdom and the foresight of the copyright owners and their chosen representatives. If they and all who deal with international copyright always remember that on the outcome of the struggle the quality of our culture and the degree of our liberties may well depend—we shall not, indeed we must not, fail.

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The Only Copyright Law We Need

by Daniel Toohey

Samuel Clemens once said that the only thing God couldn't do was to find any sense in the copyright law. Mr. Clemens lived in fairly active times for copyright laws. When he was born in 1835, this country's second copyright law was four years old. By 1910 when he died, Congress had revised the law twice more, once in 1870 and again in 1909. This writer doesn't know which particular statute prompted the sarcasm, but most people who have any contact with the cumbersome law of copyright leave the experience dissatisfied if not completely undone.

Fewer distant signals

Authors are not the only people who might share Sam Clemens's sentiment. We commoners puzzle over copyright notices posted over photocopiers, we videotape at home while four Supreme Court justices believe that we infringe, we see fewer distant signals on our cable systems because of unexplainable copyright rate increases. Our teachers labor under peculiarly exotic standards for copying classroom materials, standards of "brevity and spontaneity," and "cumulative effect." Librarians display warnings and keep a watchful eye out for "systematic reproduction or distribution" of "related or concerted" copies. We may be fined for "innocent" infringement, and the much relied upon doctrine of "fair use" turns out to be not fair at all, but a pusillanimous doctrine with narrow, grudging application.

Well-intentioned industry groups meet under the sponsorship of Congress to develop "fair use" guidelines that attempt to resolve competing interests informally, and having done so must admit that those who rely upon their conclusions do so perilously.[1]

Nothing in the underlying purposes of copyright prepares one for such a complex, vexatious law. Copyright simply strives to balance two principles: that authors should enjoy a monopoly on their works for a limited time in order to preserve their livelihood in such activities and thereby spur them on to further creation, and that their works should be accessible for people to use them as part of the artistic treasury of the nation.[2]The middle ground between the propositions of monopoly and accessibility is the battlefield where cases are fought in the federal courts and where special interests are lobbied in Congress.

Struggling in vain

The need to balance accessibility with the rights of ownership is increasingly critical as the communications revolution gains speed. Copyright now affects not only large sectors of our economy, but the everyday lives of people, as the librarian on sentry duty at the copying machine well knows. As new technologies enter the marketplace and new economic relationships among users and creators are formed, the traditional administrators of copyright law, Congress and the courts, struggle in vain to keep up. Generally, because of the time it takes for them to act and a backlog of other duties, they fall far behind.

When the United States' first copyright law was enacted in 1790 (called by Congress "An Act for the encouragement of learning"), it protected little more than printing and engraving. A satisfactory protective balance between ownership and use was achieved with periodic legislative review and it occasional interpretations of the statute by the courts. Technological and economic change occurred more slowly than today and comprehensive revisions to the copyright laws were enacted only every forty years or so until 1909.

Pulled and twisted

When the 1909 statute was superseded in 1976, the old law was exhausted from having been pulled and twisted to fit applications never dreamed of by its authors. Revision was delayed by the impossibility of writing a law specific enough for the problems at hand and general enough to present new forms of communication as they appeared. The 1976 Copyright Act occupies two and one-half times as many pages as the older law. While the 1909 law defined only two terms, the new law defined more than fifty. These two simple comparisons give only a hint of the statute's complexity. While most statutes lean on legislative intent to assist in interpreting their provisions, the 1976 law actually incorporates sometimes inconsistent documents from House and Senate proceedings. It also incorporates certain FCC

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rules which were in effect at the time but have since been repealed, leaving the law—assuming Sam Clemens was wrong—God knows where.

In spite of Congress' exertions, the 1976 statute lived up to no one's hopes. Only two years after its enactment, various parties were clamoring for major revision. Today the tumult continues. Omnibus legislation is once more in Congress, with little hope of passage. The rapid obsolescence of copyright law is not an indictment of Congress; it demonstrates that the widening scope of property rights under copyright protection cannot be contained in a static federal law. Technology easily outruns Congress's ability to provide adequate protection.

The judiciary, the other principal actor in administering copyright law, fares little better than Congress in maintaining pace with demands for protection. The well-known "Betamax" case is a good example.[3] In January 1984, the U.S. Supreme Court held, by a vote of five to four, that the sale of video recorders is not per se an act of infringement. There are other elements to the decision, but for our purposes, two important aspects of this case stand out.

Stale facts

First, the Supreme Court's opinion rested on fairly stale facts. The case began with the filing of an infringement action in 1976; the Court based its opinion on surveys of video recorder use during a 1978 sample period. As any reasonably alert person will have noticed, video recorder use has expanded dramatically between 1976 and 1984, and "time-shifting" (programs recorded off-the-air for later viewing) was the only issue before the Court, not such practices as private "dubbing" of rented items, black-market rentals and so forth.

Second, the justices repeatedly alluded to a lack of direction from Congress. The majority noted that "one may search the Copyright Act in vain for any sign that [Congress] has made it unlawful to copy a program for later viewing at home" or prohibited selling recorders. Justice Stevens, writing for the majority, said, "It is not our job to apply laws that have not yet been written."[4] The four dissenting justices had words for Congress as well. Besides regarding the majority opinion as a disincentive for Congress to patch the Betamax hole in the law, Justice Blackmun observed in his final paragraph for the minority that, like so many problems created by the interaction of copyright law with a new technology, there can be no really satisfactory solution until Congress acts.[5]

The sound one hears is that of the copyright ball being batted back and forth between two branches of government, with no need yet to awaken the President.

For the judiciary, the responsibility is to determine whether existing law has any currency to the facts at hand. If it does not, courts have two choices. They can apply a statute inadequate to the task, risking an unjust result but one which nonetheless observes the legislature's prerogative to write laws. Alternatively they may despair of Congress ever dealing legislatively with the issue before them and do some judicial lawmaking, behaving as an "activist" court.

In a hailstorm of change

For Congress, the responsibility is to write intelligible, lasting law in a hailstorm of change, with so many other demands upon its time. The author of an omnibus copyright bill wins few votes and is rewarded with few television news interviews. Yet the hapless member who undertakes that assignment must become expert in one of the most tangled, bedeviling areas of law as well as the various sciences and arts it protects, all the while facing some of the nastiest special interests in the halls of Congress. The legislators' reluctance, the long period between statutes, is not surprising. In fact, the present demand for administering copyright is probably beyond Congress's abilities and exceeds the abilities of not a few judges as well.

As a consequence, communications and data processing industries continually produce new forms of copyrightable intellectual property and new methods of exploiting existing works, with no reliable assurance that protection is available under the copyright law[6] or that the process or device is not itself an infringement.[7] The strict penalties imposed by the present law make it very risky to venture into the many "gray areas" of the copyright law, yet technological progress is almost impossible to stop. Usually it will roll right over an outmoded law.

This frustrating state of affairs results from Congress's belief that it must write a painstakingly specific statute. Instead it writes nothing at all and no workable system is at hand to balance, with the force and effect of law, the rights of creators and users of copyrighted materials as these materials become available.

An enormous difficulty

Congress could extricate itself from this enormous difficulty by writing a single law, one which creates a federal administrative agency with all-encompassing jurisdiction over copyright. Unlike the present federal agencies which have jurisdiction limited to a part of the present copyright law, such as the granting and recording of copyrights (the U.S. Copyright Office) or the collecting and dispensing of royalties (the Copyright Royalty Tribunal), the new agency would have broad administrative and adjudicative powers like the Federal Communications Commission (FCC). Fifty years ago Congress passed a law creating the FCC. The Communications Act of 1934 has undergone only moderate revision during the half-century of its regime and yet has survived radical changes in communications and technology. It has enabled the FCC to keep relatively close regulatory pace with many of the same changes in communications technology which have outdistanced the copyright law.

Today federal agencies are more likely to be abolished rather than created in favor of the marketplace as a more effective regulator. But, the marketplace has its limits; its rough and tumble cannot achieve the delicate, shifting balance between protection of ownership and creation on one side and access by legitimate users on the other. An agency, let us call it the Federal Copyright Agency (FCA), could design standards for application of fair copyright principles through regulation and adjudication. The mere act of consolidating the critical government supervision of copyright into a single federal agency would bring immediate practical benefits to the public and to the industries affected by copyright.

> *"As new technologies enter the marketplace and new economic relationships among users and creators are formed, the traditional administrators of copyright law, Congress and the courts, struggle in vain to keep up."*

Problems of narrow scope

The FCA could clarify much of the present confusion about copyright by issuing policy statements and opinions. In the rule-making process, part of which includes public comment, the agency can deal specifically with problems of narrow scope. Through these regulatory devices, the agency could respond more speedily than Congress to strike the important balance between creators and users. By centering rule-making in such an agency, the need for exactingly specific legislation by Congress would be avoided. Congress could do what it is best able to do, set general policy by statute and safeguard implementation through its oversight power, enacting corrective legislation only when necessary.[8]

By means of any federal agency's well-recognized power to waive its own rules, the FCA could recognize special circumstances while promoting uniformity. Occasionally, strict application of a rule produces an inequitable result. In such cases, agencies can waive or suspend the rule without generally repealing it. Congress can achieve a similar result but only in a cumbersome, plodding process involving special legislation.

The FCA might employ compulsory licensing when it is needed to maintain an equitable balance between public use and authors' compensation. More and more, we encounter circumstances where such a system might work well. For example, compulsory licensing might offer a simpler, more easily enforceable method of achieving a balance between the modern library and the authors whose works it stores in so many different formats. Somewhere in the many manifestations of storage, retrieval, book preservation, copying, and format transference there is an opportunity for the compulsory license to simplify in a way which fairly compensates authors and yet allows libraries room to modernize. The ability to apply such compensation schemes to fit unique circumstances, even on a temporary basis, should reduce substantially the need for countless exceptions, provisos, and guidelines in either the agency's rules or its governing statute. But only an administrative agency is equipped to do the constant fine tuning that such a scheme requires.

Promoting consistency

The FCA could be given the power to adjudicate disputes arising under the copyright law, relieving federal courts of the obligation to administer it. Today every litigated controversy under the copyright law is an expensive, federal lawsuit. The fear of such litigation and the inevitable costs and delay undoubtedly chill many legitimate uses of copyrighted works. Through the legal doctrine of primary jurisdiction (which gives the agency first crack over the courts at deciding cases falling within its regulatory ambit) the FCA could promote consistency in the law and avoid the present difficulties flowing from conflicting district court opinions from various jurisdictions. More streamlined administrative proceedings would also permit speedier resolution of claims at less cost to the litigants. Any subsequent judicial review would take place on the basis of a record developed by the agency and doctrines which limit the reviewing court's ability to review the case.

A copyright agency could become expert in the copyright and its subject matter, promoting consistent administration of the law. By consolidating the functions now separately performed by the courts, Congress, the Copyright Office, and the Copyright Royalty Tribunal (CRT), the disharmonies resulting from the independent actions of these entities could end. Thus, for example, the agency could administer the functions performed by the CRT with full authority to interpret and enforce copyright rules and the underlying statutes. Moreover, the agency's continuing participation in these related functions will produce a staff that is thoroughly expert in these matters, reducing the time it now takes government to decide copyright cases.

An agency's ability to develop statistical data on the industries it regulates is also useful, enabling it to anticipate and respond to the demands of new technologies rather than to react to problems already out of control. The need to completely understand the market of copyrightable works and their economic milieu underlies many established doctrines in the field. For example, in administering the doctrine of "fair use," the FCA could monitor developments in affected industries and identify those elements of use that unfairly limit authors' rights or inequitably restrict public benefits. A realistic fairness is the ideal this doctrine has pursued, but it requires attentive experts to make it work.

A stitch in time

A congressional stitch in time to establish a permanent, effective agency of experts will ultimately save countless hours of futile legislative and judicial work. Congress's present functions force it beyond its proper role which is that of an overseer, a creator of broad policy. Historically, social and economic forces have demanded agency regulation of commerce, communications, trade, and the environment when Congress could no longer keep pace with the level of specificity demanded in order to govern effectively. That same situation exists now in the copyright area and recommends a similar result. The day the idea for the FCA came to me was cloudless, brilliant, with exceptionally low humidity, and a gentle southerly breeze. God likes the idea or He would have made it rain. Besides, it means no more wisecracks from Clemens. ■

"Historically, social and economic forces have demanded agency regulation of commerce, communications, trade, and the environment when Congress could no longer keep pace with the level of specificity demanded in order to govern effectively."

FOOTNOTES

1. For example, Congressman Robert Kastenmaier, Chairman of the House Subcommittee on Courts, Civil Liberties, and Administration of Justice appointed a negotiating committee in March 1979 to establish specific guidelines for off-air recording by educators. The committee met and adopted a set of guidelines, but two of its members dissented, the Motion Picture Association of America and the Association of Media Producers. A member of Congressman Kastenmaier's staff was asked what weight the guidelines would carry. The response made two points: 1) the subcommittee would stand behind the guidelines and make clear that it is Congress's intent that the guidelines represent the appropriate policy behind "fair use," and 2) if educators are sued, and they end up losing, Congress will undoubtedly consider that the courts have not construed the law properly and change it. This information comes from a memorandum sent by the Public Broadcasting Service to all of its managers on January 15, 1982. It is cold comfort indeed to the educator who relies upon these guidelines and is a classic example of the frustration industry groups encounter in their attempts to devise informal standards.

2. Article I, section 8, clause 8 of the U.S. Constitution grants Congress the power to promote the progress of "science and the useful arts" by giving authors and inventors exclusive rights to their writings and discoveries for limited times.

3. Sony Corporation of America *et al.* v. Universal City Studios, Inc. *et al.*, 104 S. Ct. 774 (1984).

4. *Id.* at 796.

5. *Id.* at 819.

6. Until 1980, when the 1976 Copyright Law was amended, much debate centered around the question of whether computer software could be protected by copyright. In Apple Computer, Inc. v. Franklin Computer Corp., 714 F. 2d 1240 (3rd Cir. 1983), decided after the 1980 amendments, the issues included technical questions of whether certain forms of computer programs could be copyrighted.

7. In the Betamax case, *supra* n. 3, the question was whether the sale of Sony's video recorder was itself an infringement because the device did the allegedly illegal recording.

8. When the FCC's comparative hearing process became too protracted and cumbersome for deciding among competing applicants for low power television and certain nonbroadcast services, Congress simply authorized the use of a lottery to decide the winner.

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SPECIAL REPORT: TECHNOLOGY AND THE LAW—NEW TECHNOLOGY PUTS STRAINS ON OLD LAWS

(By Nadine Cohodas)

Item: Company A spends $40 million to develop and market a tiny, highly sophisticated silicon chip to run a home computer. Company B buys the product, copies the chip for $60,000 and markets its own, cheaper computer. Does Company A have a legal remedy against Company B?

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Item: Cable television system A, located in a rural county, provides viewers 25 channels, among them WTBS, whose signal is beamed in by satellite from 600 miles away in Atlanta. Cable system B, in an urban area 600 miles from Atlanta, also brings in WTBS. Should cable system A, because it is in a small, less competitive television market, have to pay a higher royalty fee than system B for bringing in copyrighted material via WTBS?

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Item: The FBI suspects that Mr. X is running an illegal betting operation on his home computer and wants to monitor his system. Does the current wiretap law require court approval for such FBI activity?

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These are but three examples of a myriad of difficult questions facing Congress, all the result of the technology explosion of the last decade. The issues touch copyright and criminal law, raise questions about personal privacy and national security, and in some instances affect relations between the United States and other countries.

While several House and Senate subcommittees have looked into various aspects of new technology, the bulk of the issues reside in the Senate and House Judiciary committees, which have primary jurisdiction over copyright and criminal laws.

Subcommittees with copyright jurisdiction have held hearings on a range of issues in the last year, and the two panels plan a special seminar in Florida in February devoted to new technology. Fort Lauderdale was selected because it is the site of the International Business Machine Corporation's (IBM) new plant that produces a commercially successful personal computer. The members will have an opportunity to use the most innovative computer equipment from IBM and other companies, which will bring equipment to the seminar. In addition, members will meet with panels of businessmen and academicians to discuss technology issues.

The seminar is evidence of a new congressional dilemma. Members—most of them with little or no technological background—are being asked not only to understand the complex workings of computers, microchips, satellites and the like, but to fashion laws that will properly regulate a multifaceted industry.

The Supreme Court in the last four years has dealt with a variety of issues raised by new technology, and while the court has dipped a toe into these murky waters, it has made clear that Congress should set the course.

In the most recent case, involving copyright law and the use of home video recorders, Justice John Paul Stevens wrote: "Repeatedly, as new developments have occurred in this country, it has been the Congress that has fashioned the new rules that new technology made necessary." (Weekly Report p. 95)

Rep. Dan Glickman, D-Kan., a member of the Judiciary and Science and Technology committees, appreciates the complexities of the issues facing Congress, but he worries whether members can legislate properly.

"We have to avoid being trapped in a technological snake pit, where we are enveloped in highly complex technical solutions and we defer to the engineers, the scientists to solve the problems for us. We can't do that," Glickman said in an interview.

He conceded, however, that a good working relationship between scientists and policy makers "is very much lacking."

New technology, old laws

A decade ago, Congress realized that new technology was going to create problems with old laws. In 1974, the Commission on New Technological Uses of Copyright was created and given three years to make a report to Congress on technology and the law. Some analysts believe the commission, or something similar to it, should be revived to help members grapple with even more difficult current issues. (1974 Almanac p. 290)

Rep. Robert W. Kastenmeier, D-Wis., chairman of the House Subcommittee on Courts, Civil Liberties and the Administration of Justice, which has copyright jurisdiction, also believes that Congress must be careful in handling technological issues.

"One can see problems and issues that reasonable people would like to be able to settle before technology envelops us, overruns us so we cannot respond," Kastenmeier said.

"As you keep looking at these issues, you see questions that are deeper and more complex," he added. "One of the things I'm convinced of is that I'm only looking at part of it, but I have to look at part of it. If I don't, it's too large to comprehend."

COPYRIGHT ISSUES

Copyright law is probably the area most affected by the new technology. The last major overhaul of the law was in 1976, and scientific developments made the act outdated almost before it went into effect in 1978. (1976 Almanac p. 494)

Significant questions have arisen about how to protect new creations, such as the semiconductor chip, from copying. Are they intellectual property like books, and therefore subject to copyright protection? Or are they really processes, more properly protected by patent law?

A second set of questions concerns new ways to copy old forms of information. Should extra royalties be required when copyrighted materials—television programs and movies—are transmitted by cable and satellite transmissions, or when consumers use their own video or audio recorders to tape copyrighted materials for their own use? How much is the copyright holder entitled to?

Semiconductor chips

The semiconductor chip issue is among the most troublesome, in large part because it is so difficult to define what the chip actually is.

It is something like a scientific Dagwood sandwich, a system of intricate layers of material with unique designs etched on them. The designs route electrical signals so they will perform specific tasks.

The main component of the chip is a transistor, which is an electronic device that can amplify electrical signals and can act as an electrical switch.

Transistors must be connected, or integrated, to form a particular circuit, which then performs the function desired by the chip designer, such as controlling the rate of fuel flowing into an automobile carburetor. The transistors, up to 250,000 in a single, tiny chip, are imprinted on semiconductor material, usually a silicon wafer. Silicon is used because as a semiconductor it can either transmit or block the flow of electrical impulses, in order to make the carburetor, for example, perform the desired function.

Currently, copyright protection is not available for the design or layout of the circuits, nor for the preparation of the photographic masks used to etch the layout into the chip.

It is this protection that the chip industry is seeking. California Democratic Reps. Don Edwards and Norman Y. Mineta, whose constituents include some of the major chip manufacturers and their employees, are sponsors of a bill (HR 1028) that would give limited copyright protection to the chip process.

Edwards explained that currently, a "pirate firm" can photograph a chip carefully developed by a company, analyze it and duplicate the chip's layers for considerably less money than the original product.

"Because the pirate firm does not have the enormous development costs borne by the innovator, the pirate firm can undersell the innovator and flood the market with cheap copies of the chip. Such piracy is a clear threat to the economic health of our semiconductor industry," Edwards said.

Sen. Charles McC. Mathias, Jr., R-Md., has introduced a similar bill (S 1201) that is pending before the Senate Judiciary Committee. The Patents, Copyrights and Trademarks Subcommittee, which Mathias chairs, approved the bill Nov. 15.

S 1201 and HR 1028 are similar in many respects. Both would provide copyright protection for the imprinted design patterns on semiconductor chips. The measures grant 10 years of copyright protection to those who develop new designs, giving copyright owners exclusive rights to make, distribute and reproduce images of the mask design and the chips embodying that design.

This provision is a departure from copyright law, which gives an individual copyright holder, such as an author, exclusive rights for his lifetime plus 50 years. Other types of copyright holders, such as an employee who creates a work in the scope of employment, are given protection for 75 years from publication or 100 years from creation, whichever period is shorter.

The bills also protect semiconductor chip users from liability for using a product that may have been made from a pirated chip if the users were unaware the chip was pirated. The Senate bill specifically allows "reverse engineering," which is breaking down a chip for study and analysis.

The semiconductor industry is solidly behind the chip bills. F. Thomas Dunlap Jr., an official with the Intel Corporation and representative of the Semiconductor Industry Association (SIA), told Kastenmeier's subcommittee July 30 that "it has taken the SIA four years to agree on this extension of copyright law to protect chips. It is our belief that this is the only practical method of protecting our valuable patterns."

Gerald J. Mossinghoff, commissioner of patents and trademarks, testified Dec. 1 before Kastenmeier's panel that the Reagan administration "strongly supports legislation along the lines of HR 1028."

Mossinghoff said patent protection would not be sufficient because the patent process is too lengthy, and because the layout of the circuitry is not appropriate for patent protection. Trade secret protection is available, he said, "but only up to the time that the first disclosure or unrestricted sale of the chip is made."

The copyright bills have their detractors, however, and one of them is the U.S. Copyright Office. Dorothy Schrader, associate registrar of copyrights for legal affairs, has testified in opposition to both the House and Senate bills, though she said the office believed that semiconductor chips need some sort of legal protection.

In Dec. 1 testimony before the House panel, Schrader said proposed definitions of what would be covered under the bill were stretching the constitutional basis of copyright law—Article I, Section 8 of the Constitution, which speaks of protecting "writings."

"This explicit extension of copyright to electronic devices represents a dramatic departure from 200 years of copyright legislation," she said.

Schrader said the copyright office favored developing legislation that would grant to an "industrial design" protections similar to those granted by the copyright proposals. Schrader said the design concept avoids all of the problems of forcing "traditional copyright policies and principles" to fit a new technological development.

A design bill (HR 2985) currently is pending in the House Judiciary Committee.

Concerns about the copyright bills also were raised by the Association of American Publishers and the Association of Data Processing Services Organization. Spokesmen for both organizations said they were concerned that the copyright approach would distort well-established interpretations of copyright law.

Richard H. Stern, a computer law specialist and consultant to the semi-conductor association, opposes the design concept. In an interview, Stern said design protection aims at something that is "ornamental," while the chip problem deals with something that is "functional and utilitarian."

At Kastenmeier's Dec. 1 hearing, Emory University law Professor L. Ray Patterson suggested that a new "industrial copyright" be created, separate and distinct from an author's copyright.

Patterson said that "copyright protection for the semiconductor chip in traditional terms can be analogized to a copyright for books that protects the printing press as well as the book.

Patterson said his industrial copyright proposal, while giving some of the protections envisioned in S 1201 and HR 1028, would be neater conceptually than either measure.

Kastenmeier said there is a consensus that chip protection is needed, but he remained noncommittal about whether legislation would be enacted this year. His staff is trying to draft a new bill that incorporates suggestions made at the hearings.

In the Senate, a senior Judiciary aide said prospects are good for committee approval of S 1201.

Software protection

Semiconductor chip protection is not the only copyright issue raised by computer technology. In 1980, Congress passed a law specifically giving copyright protection to computer software (PL 96-517). Since then, there has been a handful of federal court decisions amplifying the issue.

One important ruling came in a case brought by Apple Computer Inc., which sued the Franklin Computer Corp. for copyright infringement. Apple was seeking protection for computer operating instructions that were etched on a chip. Operating instructions tell the computer how to handle information.

Apple sought to stop Franklin from copying operating instructions for two popular Apple models. A federal district judge had ruled against Apple in 1982, denying the company's request for an injunction. But in August 1983, the 3rd U.S. Circuit Court of Appeals ruled that operating instructions were protected by copyright law, even if the instructions were embedded in a chip.

This was the first time copyright protection had been granted to operating instructions. In the past, such protection had been available only for so-called "applications" programs—those that take one kind of data and transform it into another.

Although Franklin said it would appeal the decision, the company settled with Apple in early January, agreeing to pay Apple $2.5 million.

Many specialists in computer and copyright law believe there still are unresolved software issues, despite the court cases. They note that the Apple case, for example, is not a Supreme Court decision and technically is not binding on the other federal appeals circuits.

In addition, there remain difficult questions over what is an infringement. Stern, for one, believes copyright law needs to be revised so that computer software is covered more specifically. In an article for IEEE MICRO, a professional association magazine, Stern wrote that the owner of a copyright on a book "can stop only the making and selling of copies of the book, not the use of the book. . . . Doubtless this principle is perfectly sound for cookbooks and pictures.

"But much of the value of computer software is in its use, and software proprietors may lose much of the value of their creations, and much of their incentive to invest in further creations, if their 'use' value can be appropriated without compensation."

New copying methods

An entirely separate set of copyright issues surrounds technology that provides new ways to copy traditional copyrighted material. Questions abound concerning the right of the copyright holder to collect new royalties vs. the right of the public to have access to copyrighted material.

No better illustration of the problem exists than the case decided by the Supreme Court Jan. 17 on the use of video cassette recorders for home taping, a copying process that often involves "time-shifting," or taping of programs for later viewing.

A 5-4 majority ruled that consumers do not violate federal copyright law when they use video recorders to tape television programs for their own, non-commercial use. The court also said that companies that make and sell the machines do not violate copyright law by making the video recorders available to the public.

In the case, *Sony Corporation of America* v. *Universal City Studios, Inc.*, Universal contended Sony was liable for contributing to copyright infringement because it marketed Betamax video recorders used by consumers to tape television programs copyrighted by the movie studio.

While the court ruled to the contrary, the justices invited Congress to take a new look at the law.

Copyright issues, wrote Justice Stevens, involve "a difficult balance between the interests of the authors and inventors in the control and exploitation of their writings and discoveries on the one hand, and society's competing interest in the free flow of information and commerce on the other. . . ."

Royalty legislation

The entertainment industry agrees with the court that home taping should not be a copyright infringement. However, it believes the copyright holders—scriptwriters, songwriters, movie studios and the like—are entitled to royalties from home taping.

For more than two years, the industry has been pushing legislation that would add a royalty surcharge to the price of video recording machines and blank tapes. The monies would go to the Copyright Royalty Tribunal, which would then disburse them to copyright holders. The tribunal was established by the 1976 law primarily to collect and disburse copyright royalties paid by cable television.

Jack Valenti, head of the Motion Picture Association of America and chief spokesman for the entertainment industry on this issue, contends that without royalty protection, the American public will be the ultimate loser because the number of creative works will decline.

Legislation (S 31, HR 1030) is pending in House and Senate Judiciary subcommittees to provide new royalties to copyright holders. But prospects for passage are unclear. Kastenmeier said shortly after the *Sony* decision that he doubted this Congress would act on a royalty bill.

Record, television rentals

Separate from the home taping issue is a dispute over the rental of records and video materials. Craft unions and copyright holders, including motion picture and record companies, songwriters and publishers, support legislation that would bar the rental of phonograph records, motion pictures or other audio-visual work for direct or indirect commercial advantage without the permission of the copyright owners. The copyright office also supports such bills.

The Senate already has passed a bill (S 32—S Rept 98-162) covering record rentals. S 32, which passed June 28, amended the "first sale" doctrine of copyright law under which some rights of copyright owners expire at the point of the first sale at the wholesale or retail level.

Under the bill, permission of owners of the copyright of the song and the record would be required before a record could be rented. The bill would allow libraries to lend records.

In supporting the bill, Senate Judiciary Chairman Strom Thurmond, R-S.C., said that while there are only about 250 record rental outlets in the United States, more than 1,700 exist in Japan, causing economic damage to that country's record industry. The same could happen here, he warned.

Thurmond said that records are rented almost exclusively for the purpose of taping, displacing sales and depressing the market. "The fact that subsequent taping is clearly the motive behind the rental is demonstrated by the fact that some record stores even include a blank tape in the price of the rented record," he said.

The Senate Judiciary report noted that under S 32, the copyright owners "would be free to decide how best to market their creative property: by sale, by rental or both. However, they would be under no obligation to authorize rentals."

Opponents of the bill, including the consumer electronics industry, record rental stores and some consumer groups, contend the legislation would give record companies control over the rental market, including the right to eliminate rentals altogether. They also dispute whether depressed record sales can be blamed on record rentals.

A similar House bill (HR 1027) is pending in Kastenmeier's subcommittee. The chairman said that even though there is only a small record rental business in the United States, Congress may want to legislate "before there is an industry of renting records that becomes formidable. . . . It may well be the case that we should legislate before the problem arises."

Legislation is pending in the House and Senate copyright subcommittees that also would amend the "first sale" doctrine for video rentals. However, neither of the bills (S 33, HR 1029) has moved.

Those bills would bar the rental, lease or lending of a motion picture or other audio-visual work for direct or indirect commercial gain without the copyright owner's permission. Neither measure would affect non-commercial transactions such as lending by a library.

Consumer electronics groups and most video rental store owners oppose the legislation.

Cable TV and copyright law

The growth of cable television in the last decade has presented another set of questions about proper compensation for copyright owners and protection of revenues for local television stations.

Cable television systems, using satellite dishes, tall master antennas or microwave relay systems, pick up signals from a variety of sources and transmit them into subscribers' homes through a cable. Cable systems can transmit both broadcast signals, which are the signals of stations licensed by the Federal Communications Commission (FCC) and available to any television owner, and non-broadcast signals. (Many news, entertainment and sports networks, reach their customers through non-broadcast signals.) Cable operators also can originate programming from their own studios.

Under current law, cable television systems pay a compulsory license fee to the Copyright Royalty Tribunal for use of copyrighted materials. This arrangement has spared cable systems from negotiating directly with every copyright holder when they retransmit a signal carrying copyrighted material.

In 1972—the infancy of cable television—the FCC restricted the number of signals that could be imported by a cable system from outside the local service area.

The reason for the rule was protection of lacal television stations, which the FCC believed might be harmed by competition from distant stations. The threat was perceived to be greatest in rural areas, where there were few stations. As a result, the

FCC limited the number of distant signals carried by cable systems based on their location.

Cable television systems in the top 50 television markets were permitted to carry up to three distant, independent, non-network televison signals. They paid .799 percent of gross receipts as a royalty rate for the first signal, and .503 percent for each of the second and third signals.

Systems in markets 51-100 could carry two distant, independent television signals, paying .799 percent for the first signal and .503 percent for the second. Those systems in smaller markets, defined as any town with at least one television station that is not in the top 100 markets, were permitted only one independent, distant signal. They paid .799 percent of gross receipts for that signal.

In 1980, the FCC, after careful study, decided no justification existed for the distant signal restrictions and repealed them. When the FCC repealed the limits, the copyright tribunal began proceedings to determine an appropriate royalty rate for new distant signals.

The new rate set by the tribunal took effect March 15, 1983. It required 3.75 percent of gross receipts for each distant signal allowed under the old rule—a substantial hike from the old rates. Thus, the smallest systems would have to pay 3.75 percent of gross receipts for their second and third distant signals, while the largest systems could continue to bring in three signals at the old rate. The 3.75 percent rate would not apply for them until a fourth distant signal was brought in.

The royalty tribunal said the new rate was based on an assessment of what cable systems would have to pay for distant signals in a free market, in the absence of the copyright licensing scheme.

The new rate was immediately challenged by the National Cable Television Association (NCTA), which represents about 2,000 cable system owners.

The NCTA claimed that the tribunal acted improperly in raising the royalty rates so dramatically. However, the rate was upheld in a Dec. 30 decision of the U.S. Court of Appeals for the District of Columbia. The court said that Congress intended the tribunal to have wide latitude in setting royalty rates, and that there was no evidence to conclude that the tribunal had acted unreasonably.

Since the rate went into effect 11 months ago, cable companies and satellite common carriers, which provide signals to cable systems, have charged that the rate severely damaged their businesses because the cable systems cannot afford as many distant signals.

Rep. Sam B. Hall Jr., D-Texas, sponsor of a bill to ease the impact of the new rule, told Kastenmeier's subcommittee Oct. 19, 1983, that the tribunal's rule meant "immediate discontinuation of many distant broadcast signals by cable systems and a consequent wholesale loss of programming to the public.... This loss was particularly severe in rural areas," Hall said, "where diverse television service is needed but is all too often lacking."

Hall's bill (HR 3419) would provide exemptions from the tribunal's rate structure for broadcast stations such as WTBS in Atlanta that engage in national marketing and negotiate directly with copyright holders for use of their materials.

Rep. Mike Synar, D-Okla., has introduced a separate bill (HR 2902) that would permit all cable systems, regardless of market location, to carry at least three distant signals without having to pay the new 3.75 percent royalty rate. He said his bill presumed that systems would continue to pay royalty rates for the first three signals under the old formula.

In House subcommittee testimony Oct. 19, NCTA President Thomas E. Wheeler said NCTA research showed that 76 percent of those cable operators liable for the new copyright fees had had to drop one or more distant signals they had added after the FCC deregulation in 1980.

The Motion Picture Association applauded the new rate structure. Fritz Attaway, its counsel, said in an interview that the old rates were inadequate and amounted to a "subsidy" for cable systems. "For the first time, we received something approaching fair market value."

Cable and Canada

Still another cable issue involves the United States and its Canadian neighbors, an issue of particular concern to Sen. Patrick J. Leahy, D-Vt.

The problem, according to Leahy, is this: Canadian cable systems are able to pick up U.S. broadcast signals and retransmit them to Canadian viewers. However, the Canadian systems are not paying any compensation to U.S. copyright holders whose works are embodied in those signals, even though U.S. cable operators must pay Canadians for similar use of their copyrighted works.

Leahy has introduced a bill (S. 736) to address the problem. He calls it the "international copyright fairness bill," and although it would apply to any foreign country, it is primarily aimed at Canada. Leahy's measure would require that before royalties are disbursed to non-resident foreign nationals for cable retransmissions, the Copyright Royalty Tribunal must find that the claimant's country provides equivalent compensation to American copyright holders for use of their materials. If no such finding can be made, the tribunal would retain the claimant's fees.

"Canadians remain entitled to their fair share of cable copyright royalty fees," Leahy said when he introduced the bill last March. "However, a fair share must be fair to everyone. That is all we are asking of the Canadian government, a fair opportunity for Americans to be compensated for the use of their creative works."

Leahy's bill is pending in the Senate Judiciary copyright subcommittee, where a hearing was held on the measure Nov. 15, 1983.

Spokesmen for the Canadian Broadcasting Corporation and the Canadian Association of Broadcasters acknowledged there were problems to be worked out between the United States and Canada. However, both representatives and David Ladd, the U.S. register of copyrights, who also testified, expressed strong reservations about Leahy's proposal.

A Judiciary Committee staffer said privately that Leahy was really more interested in "getting the Canadians' attention" on the problem than passing the legislation.

Dirty dishes?

The problem of unauthorized use of copyrighted material surfaces in still another technological area—use of "dishes" and decoding devices set up in back yards or on rooftops to snag signals. This issue, according to Attaway, is often less a copyright issue than a matter of federal communications law.

When a person installs a receiving dish to bring in special programming, such as from pay television stations offering movies, he does not violate the copyright law unless there is a "public performance" of a program.

There is no public performance if the person simply views the program at his home, even if he invites friends over to watch. However, if a dish is installed at a bar or a fraternal lodge, and groups of people can watch it, this, according to case law, would be a "public performance" and in violation of the copyright laws.

The law is somewhat unclear in this area, Attaway said, because there is no clear definition of what is a "public performance."

Most often, according to Attaway, dish owners violate a section of the 1934 communications act that bars the unauthorized interception of broadcast or radio signals.

Enforcement of this law has been spotty, and virtually non-existent against an individual homeowner. Instead, the lawsuits initiated in the past few years have been brought by television services against the makers of signal decoders, which are necessary to unscramble the signals transmitted by some pay television services.

SECURITY/PRIVACY ISSUES

Copyright questions are only part of the problems raised by the new technology. Equally difficult issues concern the security of computer systems and the information each system contains.

The issues were succinctly stated last Oct. 24 by computer security specialist Willis H. Ware, a member of the corporate research staff of the Rand Corporation. Ware testified during one of three days of hearings on security questions before the Science and Technology Subcommittee on Transportation, Aviation and Materials, headed by Rep. Glickman.

"Computer security is of importance whether the information to be protected is personal in nature and therefore relative to privacy; whether it is defense in nature and therefore related to the security of the country; or whether it is sensitive in nature and therefore relevant to corporate welfare in the private sector," Ware said.

"The important point to be noted is that a comprehensive set of security safeguards within and around a computer-based information system is an essential prerequisite for assuring personal privacy."

Computer security

The issue of computer security has been underscored in recent months because of reported instances in which so-called "hackers" have been able to break into government and private sector computer systems. One of the more notable episodes involved the "414" group, named for the telephone area code of young computer enthusiasts in Milwaukee, Wis. Over a period of time, these young men gained access to about 60 computers, including systems at Memorial Sloan Kettering Cancer Center in New York City and the Los Alamos Laboratory, a government nuclear weapons research center in New Mexico.

Spokesmen for Los Alamos said the intruders did not gain access to classified or sensitive data. Sloan Kettering officials said the intruders threw administrative records into disarray but that no patients were harmed.

To help prevent such occurrences, members of Congress have introduced bills (S. 1733, H.R. 1092) to make unauthorized use of computers a federal crime. However, the bills have not been well received.

One Republican Senate Judiciary staffer who has studied the legislation said that as drafted, it sweeps too broadly. He said it could give the federal government jurisdiction over a wide range of activity that more properly should be left for state law enforcement.

Similar concerns were expressed by John Shattuck, head of the Washington office of the American Civil Liberties Union (ACLU).

Some representatives of private industry testified in support of computer crime legislation at the Science and Technology hearings. They said that such a law at minimum would make the public more aware of the computer crime problem.

Chairman Glickman said he does not expect legislation to come out of his panel in 1984, but he said the subcommittee will issue a report on the subject.

Determining just how much computer crime exists is difficult. In testimony Oct. 17 before Glickman's panel, Floyd I. Clarke, of the criminal investigative division of the FBI, said there was "no method in place now to observe the statistical dimensions of computer-related crime. . . . There is no one agency at this time that has jurisdiction for computer-related crimes and very probably there cannot be because of the wide application of computers."

Clarke said the FBI views a computer as an "instrumentality of some other form of traditional crime, for instance theft or larceny. It is much like a gun, a knife, or a forger's pen."

Several of those who testified said the government could help the private sector with security matters not by crime legislation but by establishing guidelines for adequate security.

Jack L. Hancock, a senior vice president of Wells Fargo Bank, suggested that an independent agency be created to certify that a security device or technique meets specified minimum requirements.

He also discussed what he called "computer ethics."

"It seems as though there is a feeling that attempting unauthorized access to a computer system is fun and games, particularly if nothing is lost or stolen," Hancock said. "This attitude needs to be changed, and schools that teach computer science must also teach the ethics and morals associated with computer use. Otherwise, we will have a very serious crime problem in the future."

At least one company seems to agree with Hancock's observation. On Jan. 20, IBM took out a large newspaper ad telling readers, "Everyone knows that the rules of the road have to be taken seriously. So do the rules for using a computer. Two of those rules are basic: Everyone who uses a computer has a responsibility for the security of the information in that machine. No one who uses a computer has the right to violate anyone else's security. . . . Both the suppliers and computers, software and telecommunications have a responsibility to help ensure that such information systems are used conscientiously, and with the understanding that other people depend on these systems too."

Privacy matters

Concerns about personal privacy are as pervasive as concerns about computer security. What is at stake, according to the ACLU's Shattuck, is the ability to assure citizens that personal, and perhaps sensitive, information about them is kept private. "The technology has so far outstripped the protection of privacy that a great deal of new lawmaking is necessary," Shattuck said in an interview.

One example that Ware cited in his testimony is the use of electronic mail, the transfer of information by electronic device.

With such services "vast amounts of information about people" is transmitted, Ware said. The mere exchange of information relates addressee and sender, he noted, adding that "in principle, such information could be used to establish relationships among groups of people, such as organized groups or circles of acquaintances.

"Obviously such information could be of high interest to the law enforcement community, but the legal umbrella of protection over such information is confused and probably incomplete."

One area that worries Shattuck and many other privacy specialists is the current wiretap law. Under the present 1968 law, it is a federal felony for a third party to intercept the conversations of others by placing an electronic listening device or other "bug" on a telephone or in places such as an office.

An exception exists for federal, state and local law enforcement officers, who can use wiretaps for investigations so long as they have the approval of a specific prosecutor and have obtained a court order.

The law apparently does not apply to tapping into a computer, because the law defines the word "intercept" as the "aural acquisition" of information, and computer transmissions do not involve sounds.

One federal appeals court came to this conclusion, as did various privacy specialists and the General Accounting Office in a 1980 report.

This issue was discussed during a hearing Jan. 24 before Kastenmeier's subcommittee that dealt with the wiretap law generally.

The Rand Corporation's Ware suggested that Congress revise the 1968 wiretap law so that "it is the legal basis for protecting against unauthorized interception wherever it occurs." He cautioned against a "piecemeal" approach that only dealt with certain types of technology.

Although the privacy issue is complicated, Shattuck said it was important to remember that Congress already has dealt with some privacy matters. The 1974 Privacy Act, for example, bars the government's use of personal, private information collected for one purpose for a totally different purpose.

It also permits an individual access to personal information contained in federal agency files and to correct or amend the information. (1974 Almanac p. 292)

"We're not writing on a clean slate," he said. "The bottom line politically," Shattuck added, "is that all of these problems are quickly rising to the surface, but I don't believe the legislative solutions to them are going to be that quick."

[From Billboard, Nov. 12, 1983]

[Copyright Billboard, (1943), reprinted with permission]

Copyright at the Crossroads

By Jon Baumgarten *

As early as 1945, Prof. Zachariah Chaffee described the relationship between copyright and technological innovation as follows:

"Copyright is the Cinderella of the law. Her rich older sisters, Franchises and Patents, long crowded her into the chimney coner. Suddenly the Fair Godmother, Invention, endowed her with mechanical and electrical devices as magical as the pumpkin coach and mice footmen. Now she whirls through the mad mazes of glamorous ball."

The magical devices noted by this scholar were motion pictures and radio. Since that time copyright has come face to face with over-the-air, cable, subscription and direct broadcast television; satellite, microwave and laser interconnection, network and delivery systems; photocopying and microform reproduction, further enhanced by electronic search capabilities; computer imput, manipulation, retrieval and transmission; vastly inproved means of audio and video recording; object code, bubble and optical/digital storage; software and firmware; etc.

Those of us fortunate to practice law on the cutting edge of copyright have to develop new vocabularies. Where we once spoke of paragraphs, scenes and lyrics, copying and paraphrasing, licenses and options, we now talk about bits, bytes and pixels, downloading, downlink intercepts, and reverse engineering, vertical blanking intervals, source code escrows, and beta testing.

Fascinating? Yes! But glamorous? I suggest that, from the viewpoint of copyright proprietors, the result has not altogether been one of glamor. To a greater extent, and increasingly so, the new technologies tend toward erosion of both copyright owners' rights and their abilities to control or secure compensation for the use of their works. Equally disturbing, these developments have contributed to popular, political, and in some cases even to judicial denial of the fundamental legitimacy of copyright.

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The technological revolution clearly holds great promise, but whether the copyright system will survive the headlong rush to fulfill that promise or be trampled in a technocratic stampede deserves the most careful consideration. This concern goes well beyond the particular interests of individual copyright owners, for our system is based on the Constitutional premise that the public interest is best served by assuring economic incentive to creative effort.

This premise, I might add, has in the past proved itself manifold in the richness of this country's scientific, intellectual and artistic products and in the diversity of the channels of communication open for expresion of the most conventional—or heretical—of views.

Technology's impact on copyright owners undoubtedly takes several forms. It can be seen, for example, as having the beneficial effect of offering new or expanded market possibilities. But to stop there would be superficial, for it has other, troubling effects (on prior or more traditional markets, as well as on the reality of those newly made possible). Let me briefly catalog some.

It has made reproduction of copyrighted works a simple and relatively inexpensive task, moving even commercial piracy to within easy reach and mobility (e.g. record, tape, and computer software and chip piracy).

It has decentralized unauthorized duplication, generating forms of infringement that assume significance principally when it is recognized that they must be viewed on a cumulative or aggregate basis (e.g. photocopying, concert bottlegging, off-air recording).

It has changed the locus of infringement, moving it from public activity to private or semi-private contexts and raising practical problems of detection and enforcement, as well as concerns over intrusion (e.g., home audio and video recording, intra-corporate photocopying, program and data base appropriation).

It has distorted traditional roles played by publishers and consumers of copyrighted works. The consumer is now capable of serving as the publisher, creating copies as and when needed, on demand (e.g., photocopying, audio and video recording, software duplication).

It has created an enormous public appetite for immediate access to copyrighted works, one having little patience for the nicetices of property and contributing to resurrection of the old misguided shibboleths of copyright (e.g., as a "monopoly" or "obstacle" to dissemination) as well as to new ones (e.g., equating "public air waves" with "public domain," and creating a false dichotomy between the "private" interests of authors and publishers and a higher "public" good).

For copyright to survive, a number of steps must be taken, including education as to the values of the copyright system and the dignity of intangible property; copyright owners' own reexamination of existing permissions and and marketing systems; litigation, where necessary; and innovative legislation. The latter may be particularly important, but practically quite difficult because of perceived political problems in causing alleged consumer "deprivations."

One of our problems is that the very speed of technology means that copyright owners are often playing catch-up, seeking relief after the public has become accustomed to appropriating the intellectual property of others for free, an attitude that is not easily countered.

Yet, if copyright is to continue to serve the interests of both creators and society, our legislators must accept the recent admonition of Sen. Charles Mathias, chairman of the copyright subcommittee of the Senate Judiciary Committee, that:

"Failing to protect (rights of copyright owners) is not excused by the fact that new technologies have made the protection of those rights more difficult. The very ingenuity of our age that has produced these remarkable technologies should be able to devise the laws to accommodate them."

I must concede, of course, that my conclusion to this point rests on an assumption—namely, that copyright *should* survive. This is an assumption that has, on occasion in the past and more often of late, been questioned. Technology, we are told by some, will make copyright obsolete.

I do not accept this assertion. Some specifics of copyright law may change—some may have to change—but the basic principles of copyright, the dignity of creations of the intellect as well as of physical labor and the encouragement of creative effort through economic reward will, I think, bear retention.

The alternatives are not acceptable: a diminishing of creative commitment and investment; a minimizing of alternative, even beneficially redundant, channels for expression; and the substitution of some institutional, central or official authority in the process of creation, selection and publication.

[4 Science 67 (May 1983)]

Playing Hardball With Software

ILLICIT COPYING OF COMPUTER PROGRAMS IS ON THE RISE; PIRATES SAY IT'S NECESSARY; PROGRAMMERS SAY IT'S UNETHICAL; BOTH USE EVERY TRICK IN THE BOOK

(By Gina Kolata)

In October of 1980, David Alpert, a commodities broker living in Chicago, went to a meeting of Apple computer users that was to change his life—and the lives of many unsuspecting computer software manufacturers. At that meeting another member of the group approached Alpert about marketing a new program he had developed. The program would allow small computers to copy computer programs that manufacturers had tried to make uncopiable.

With the advent of small personal computers, a flourishing business sprang up to sell software programs that tell the computer what to do. This software is frequently sold as "floppy disks," or "diskettes," flat circular pieces of plastic the size of 45 rpm record. Each diskette holds, on its concentric "tracks," more than a hundred thousand bytes of information.

It is illegal to copy computer software, just as it is illegal to photocopy books or magazines or to tape records. But prosecution is extremely difficult, and copying is rampant. "I don't know anyone with a personal computer who doesn't have about $500 worth of free [pirated] software," says Allan Tommervik, publisher of Softalk magazine. The computer programs are enormously time-consuming to develop, so manufacturers frequently charge hundreds of dollars for programs. The blank diskettes themselves cost only a few dollars, though, and a diskette can easily be copied in one or two minutes. Thus it quickly became common for owners of small computers, and especially for members of groups such as the Apple users to exchange and copy computer programs. To thwart this practice and force those who wanted a program to buy it, in 1978 manufacturers began to use "copy protection."

Ordinarily when a computer copies a program from one diskette to another, it expects the program it is copying to be in a standard form. If it isn't, in theory it cannot be copied. Copy protection varies the way the program is recorded on a diskette. For example, part of the progarm would be on the first track, another part would be between the first and second track, and another part on the fourth track of the magnetic diskette. Or the diskette might have periodic blank spots incorporated into it. Such schemes confuse the computer and bring copying to a halt.

Software development is still very much a cottage industry. Tommervik estimates that about 1,800 companies sell software, but most of them employ no more than five people and make less than $500,000 a year in sales. Many firms teeter on the edge of profitability: If they lose substantial numbers of sales to pirates, they will go under.

Alpert says he hesitated when he was approached ("I thought of the ethics"), but he saw a legitimate need to copy the software. It is easy to destroy a diskettee—all you have to do is step on it or expose it to heat or sunlight or have a power surge or failure while using it. If a diskette is ruined, most manufacturers will supply a new copy, but often they require the user to send back the original diskette and in many cases charge as much as $30 for the copy. It also can take six weeks or longer to get the new diskette. If the original diskette was being used by a business for an essential operation such as payroll, the result of a diskette failure could be disastrous.

A second factor in Alpert's decision was an amendment to the Copyright Act then before Congress. Computer law specialist Laurance J. Ochs, an attorney and founder of the Washington, D.C. firm Compulaw, explains that when you buy a copy of a computer program, you don't actually own the program itself. What you have bought is the license to use it. But this new amendment stated that it would not be an infringement of copyright law for the owner of a computer program to copy it for his own use as a backup, though it would remain illegal to copy it for someone else. So Alpert formed a software company, Omega Microware, to market the protection breaking program, which he called Locksmith. "In December of 1980, President Carter signed the bill into law," recalls Alpert. "In January of 1981, the first ad for Locksmith hit the magazines." Later that year Locksmith was joined by a similar product called Nibbles Away, marketed by Micro-Ware Distributing of Butler, New Jersey. In subsequent months other companies began to market further variations of protection breaking programs.

Since then software manufacturers and the makers of copies have been locked in a continuing duel of wits. Both Locksmith and Nibbles Away have undergone some modifications as protection has made more devious debugging necessary. Some software manufacturers are toying with still more subtle kinds of protection; others are deciding to forego copy protection altogether, reasoning that because they cannot keep up with the copiers, it is not worth the expense and inconvenience to customers to sell copy-protected programs.

But for now, at least, the dilemma remains. How can software piracy be prevented while letting software users make the backup copies they need? Although no one really knows how much money software companies are losing to the pirates, the consensus in the industry is that software piracy is a serious problem. John Gill, a professor of computer science at Standford University, cites estimates that for every nongame diskette sold, four or five copies are made and passed around. Ernie Brock of Sirius Software, a game manufacturer in Sacramento, says that for game software the estimates is 10 copies for each one sold.

Everyone agrees on the need for backup diskettes, at least for business software. An increasing number of small businesses use personal computers for word processing, payroll, and bookkeeping, and even if their floppy disks never get damaged, they still wear out. If a business does have a backup copy, "It is common that whatever wiped out the first diskette will destroy the second," says Gill. "You need the ability to make as many copies as you want.

Many software manufacturers claim their customers need not worry about making copies because they will supply a backup program, but Brian Strong, publisher of "The Electric Apple" in Wellington, New Zealand, sees flaws in that. In a letter in the May 3, 1982, issue of the computer newspaper InfoWorld, he outlines why he sees a need for copiers. "In two cases, now over six months old, registration cards were sent with an inquiry on the cost of a backup disk and no reply has been received. . . . One small business I know nearly went bankrupt when the master disk crashed and the backup took nearly three months to arrive."

But these may be extreme cases. The real question is, How many people who buy protection breaking programs intend only to back up their own software? Lou Ploch of Nibbles Away says that most of his customers are individual users who buy primarily games, but they also include large corporations, radio and television stations, and at least one government agency—hardly the sorts of customers to be engaged in large-scale piracy. Ploch admits, however, that he is selling more and more copies of Nibbles Away to computer stores, who presumably sell it to individual users. It is these users who are most likely to trade software and make copies for friends.

What computer hobbyists copy and pass around most are games, and the makers of both Locksmith and Nibbles Away provide game parameters, essential for anyone trying to duplicate a program, Parameters tell the copying program which protection scheme is being used in a particular program and give the user's computer explicit instructions to unscramble it.

The game manufacturers are the most affected and the most angered by Locksmith and Nibbles Away. Many of them have pressured computer magazine publishers not to accept ads for copiers, saying they will pull their game ads from any publication that advertises the copying programs. Beyond this, however, there is little they can do.

Both Ploch and Alpert say they are trying to be ethical about this issue. Ploch gives a game one or two months on the market before he publishes parameters for it. Alpert won't give out parameters for games if the manufacturer replaces a diskette for less than six dollars and does it in one to two weeks. He won't give out parameters for business software if the manufacturer supplies two copies at the point of sale and replaces damaged disks quickly and for less than six dollars.

Not everyone, of course, is impressed by Ploch's and Alpert's ethical claims. "Who made them God?" asks Tommervik. "Who are they to say someone has to conduct business in a certain way or he's going to rip them off? In my opinion, [their statements] are a left handed admission that these products are being used illegally."

Most experts say that any sort of copy protection is no better than a lock on a door—it will discourage the casual thief, but it can never be invulnerable to a serious assault. Those who are in favor of making even better locks, however, support a number of new ideas for copy protection.

One possibility is for all manufacturers to install serial numbers in the computer's permanent memory. Only some do now. Software would then have programmed into it the serial number of the buyer's computer and would not run on any other. Such a scheme, says Gill, "is easy to do. And once you do this, it prevents you from just copying and distributing software. You can always break the system, but if you break it for the purpose of making copies in large volumes, you have a good chance of being detected."

Brian Reid, a computer science professor at Stanford University, suggests taking this idea one step further and writing programs that automatically crash after a set period of time if they are run on a computer whose serial number differs from that of the computer for which the software was bought. This would involve specific instructions in the computer program telling the program to stop working when an internal clock in the computer reaches a particular time and date. "If a program fails at the very beginning," says Reid, "people often are ready to deal with it and fix it so that it runs. A time bomb is much more devastating. After a few months, you come to depend on a program, and you have forgotten how it works."

But not every small computer has a serial number, and not every samll computer has a clock. Moreover, pirates could figure out how to change serial numbers and set clocks back. So these new schemes are hardly foolproof.

Some manufacturers of nongame software have decided that the best strategy for now is to simply give up the idea of copy protection—and they are using this as a selling point. Mark Pelczarski of Penguin Software in Chicago says his sales have increased fivefold since he dropped all copy protection last February. Some of that increase is due to increased advertising and more distributions, he says, but he has no doubt that dropping copy protection played a role.

Pelczarski says he decided to forego copy protection in part because of his own experience as a programmer. He needed multiple backup copies of important diskettes, and he liked to modify programs to suit his needs—something that can't be done when diskettes are copy protected. "I found that I was using programs that were not copy protected even though there were better programs on the market that were protected," he says.

Beagle Brothers Micro Software also advertises that it does not use copy protection. "It's a superb selling point. People can take our disks, alter them, and customize them," says Bert Kersey of Beagle Brothers. "I just think that's what it's coming to. Most people can make copies of copy protected software, so why copy protect?"

But those who sell unprotected software are still in the minority. Ken Klein of Stoneware, Inc. concedes that protected software can be broken, but "everything can be broken, just like all locks can be picked. I think copy protection basically keeps honest people honest." Jerry Diamond of VisiCorp, which makes the enormously popular program VisiCalc, agrees. "There is no dobut that discouraging people from copying makes sense. It makes no sense to make it easy for people to break the law."

Most manufacturers, in fact, still see copy protection as the only way out. And while no one is entirely satisfied with protection schemes that now exist, there is no consensus on what, if anything, to do. This breeds pessimism in people like John Gill. "My feeling," he says, "is that there's not going to be a solution." If he's right, it may be the first problem the computer industry has found uncrackable.

Information Systems and the Role of Law: Some Prospects

Paul Goldstein

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BOOKS Reviewed

Information Systems and the Role of Law: Some Prospects

Paul Goldstein*

COMPUTERS, COMMUNICATIONS, AND THE PUBLIC INTEREST. Edited by Martin Greenberger. Baltimore and London: The Johns Hopkins Press. 1971. xix + 315 pages. $12.50.

Developing alongside the modern concern for environmental quality are some newer issues of resource management. Unlike problems of environmental quality, which stem in large part from decisions respecting the production, distribution and use of goods, these new resource management issues stem from the economy's service sector and, more specifically, from dramatic increases in the production and distribution of information. For some of these new issues, solutions already worked out in the context of environmental planning will doubtless prove apt. For most of the problems raised by the burgeoning information technologies, however, the situation now is comparable to the one that faced environmental planners in the early 1960's: technological developments must be predicted, consequences assessed, strategies mapped.

Prospects for the development and management of information systems form the concern of *Computers, Communications, and the Public Interest*, a collection of eight lectures, with attendant comments and discussion, presented under the joint auspices of the Johns Hopkins University and The Brookings Institution between September 1969 and May 1970. The range of issues considered is indicated by the topics addressed: "Large Time Sharing Networks," "Designing Organizations for an Information-Rich World," "Communications in the National Decision-Making Process," "Education in Modern Society," "Civil Liberties and Computerized Data Systems," "Property Rights Under the New Technology," "Developing National Policy for Computers and Communications," and "Man and the Machine: Prospects for the Human Enterprise."[1] Under the series' format,

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The author is grateful to Professor John Barton, Stanford Law School, for his helpful comments on an earlier draft.

[1] For purposes of convenience, these topic headings will be treated as the titles of the respective main papers.

each main paper was followed successively by prepared comments delivered by each of two discussants, discussion among the three participants centering on questions from the audience, and informal dinner discussion.

The papers and commentaries assembled in this book are, on the whole, first rate. At their least impressive, they rehearse developments in the field under discussion and restate the major policy issues. At their best, they move present thinking in their respective fields a step forward. What many of the papers lack, however, is a sense for the richness and variety of social institutions, law among them, and a sense for the possibilities of managing information systems through other than the present institutional structures —copyright or patent protection for information's production, for example, or FCC regulation of its transmission. Also unexamined are possible alternatives to present institutional consequences—treatment of privacy as a priceless interest, for example, or exclusion of the poor from access to the benefits of technological advance. With the exception of this last, these omissions are not cause for criticism, for they fall outside the intended scope of most of the papers.

Yet, if these omissions provide no fair occasion for criticism, they do underscore the need for canvassing institutional alternatives and for identifying some of the policy implications of choosing—or retaining—one institution over another. This Review provides some directions for such a canvass. Part I pictures, quite generally, some developments in information technology that can be expected to occupy the remainder of this century; it identifies, too, the central resource to be managed: time. Part II considers the role of property and regulatory institutions in the new information setting; Part III, some prospective changes in alignment between individual and society.

I. TECHNOLOGY AND TIME

Some of the developments forecast for the information technologies can be suggested briefly.[2] At the core of future information systems will probably lie cable networks carrying an abundance of channels into homes and offices; eighty or more cable channels are now technically feasible and sharply increased capacities are in prospect. And, while cable systems presently serve comparatively few American homes, penetration is expected to reach between 40 and 60 percent by 1980. Nor will the services provided be confined to television's customary one-way transmission mode: it is estimated that by 1990 reactive, subscriber-response systems, enabling the viewer to order up desired information from his facility and, indeed, himself to broadcast information, will be in common use.

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[2] The projections employed in this description are drawn primarily from B. BAGDIKIAN, THE INFORMATION MACHINES ix–xxxvi (1971); D. PARKHILL, THE CHALLENGE OF THE COMPUTER UTILITY 153–71 (1966); SLOAN COMM. ON CABLE COMMUNICATIONS, ON THE CABLE 35–46 (1971); D. Little & T. Gordon, Some Trends Likely to Affect American Society in the Next Several Decades, Apr. 1971, at 43–44 (Institute for the Future, Working Paper WP–16); Baran, *Some Changes in Information Technology Affecting Marketing in the Year 2000*, in CHANGING MARKETING SYSTEMS 76–87 (R. Moyer ed. 1967); Parker & Dunn, *Information Technology: Its Social Potential*, 176 SCIENCE 1392–99 (1972). The prospects outlined here, and those identified in the course of this Review, are skewed toward the more conservative forecasts.

Developments in cable will be closely linked to developments in other technologies: communications satellites can be expected to facilitate national and international networking of programs and messages; computer systems, themselves employing cable as a medium for data transmission, may, through their message switching capacities, aid cable users in the selection of information. Facsimile transmission—already available in rudimentary form over the telephone lines in major cities—and electronic video recording also seem likely to play an important role, significantly enlarging the business, educational, and entertainment uses of the home information console.

A virtually boundless, possibly overwhelming, amount of information may eventually be transmitted simultaneously over the cable. The weather reports, teletyped news bulletins, and stock market quotation services presently occupying some of cable's surplus channels may some day be joined by programs, among others, devoted to entertainment, education, and vocational and avocational pursuits. Some of this programming the viewer will pay for directly while other programs will probably be supported by advertisers or by government subsidy. Subscriber-response systems—presently confined to the telephone system and to cable-based home burglar and fire alarm systems and utility meter reading devices—may come to incorporate some of the functions now discharged in schoolhouse and university and, through the retrieval on demand of centrally stored information, some of the functions today served by libraries. Health care information and delivery systems may link doctors to patients, to other doctors, to university centers, and to libraries. Shopping and news services, enabling the consumer to summon precisely the news or sales information he desires and to enjoy increasingly more detailed information at will, may develop as may new varieties of political conduct—instantaneous polling of the electorate, perhaps, and, probably much more important, enhanced opportunities for direct individual participation in community decisionmaking.

The fundamental difference between planning for environmental quality and planning for information systems lies in the nature of the resource to be managed. For environmental policy, the relevant resources are air, water and land. For information policy, the relevant resource is time. With drastic and continuing increases in amounts of available information, planning's critical task will be to assure that individuals and institutions, possessing only a finite resource of time, are able to devote their time to the reception of that information that has the highest utility for them. Professor Herbert Simon, a contributor to the book under review, speaks of "scarcity of attention in an information-rich world," and observes:

> It is not enough to know how much it costs to produce and transmit information; we must also know how much it costs, in terms of scarce attention, to receive it. I have tried bringing this argument home to my friends by suggesting that they recalculate how much the NEW YORK TIMES (or WASHINGTON POST) costs them, including the cost of reading it. Making the calculation usually causes them some alarm, but not enough for them to cancel their subscriptions.[3]

That time is a scarce resource is hardly a novel proposition. Yet, as Simon's example suggests, the notion's implications in the broader context of information economics have been at best dimly perceived, a disregard resting on assumptions comparable to those of limitless air, water, and land resources that persisted well into the middle of this century. This is the case in part because the present quantities of available information relevant to individual and institutional needs are not altogether disabling, a condition, in the case of broadcasting, attributable to the natural factor of a scarce transmission resource—the electromagnetic spectrum—and the FCC's reluctance to encourage departures from this transmission mode; and, in the case of the print media, to the costs of paper, printing, and distribution.

Once appreciated, the implications of time's scarcity will, in the information context, call for important alterations in legal institutions and doctrine. An example, drawn from current free speech dogma, is suggestive. It has widely been assumed that the effective dissemination of a broad range of political ideas will be guaranteed only by securing access to the information media for spokesmen of all shades of opinion.[4] This view informs the FCC's administration of the fairness doctrine[5] and the recent insistence both by the FCC and private institutions that a number of cable television channels be set aside for use, at minimal or no cost, by all who wish to have their say:[6]

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[3] P. 41.

[4] *Compare, e.g.*, Barron, *In Defense of "Fairness": A First Amendment Rationale for Broadcasting's "Fairness" Doctrine*, 37 U. COLO. L. REV. 31 (1964), *with* Barron, *Access to the Press—A New First Amendment Right*, 80 HARV. L. REV. 1641 (1967).

[5] *See* text accompanying notes 51–54 *infra*.

[6] *See, e.g.*, SLOAN COMM. ON CABLE COMMUNICATIONS, *supra* note 2, at 123–34; Cable Television Report and Order, 37 Fed. Reg. 3252, 3269–70 (1972): "¶ 121. Broadcast signals are being used as a basic component in the establishment of cable systems, and it is therefore appropriate that the fundamental goals of a national communications structure be furthered by cable—the opening of new outlets for local expression, the promotion of diversity in television programming, the advancement of educational and instructional television, and increased informational services of local governments. Accordingly, cable television systems will have to provide one dedicated, noncommercial public access channel available without charge at all times on a first-come, first-served nondiscriminatory basis and, without charge during a developmental period, one channel for educational use and an-

> Finally, we must suggest free access on a regular basis, say five minutes per month per person, for all persons who cannot otherwise afford to place their message on the public cable. (Groups could get together and pool their time for longer presentations.) Common carrier access to a cable can guarantee everybody who can afford the charges the opportunity to blow off steam before a camera. Surely this luxurious application of the First Amendment should not be denied the poor.[7]

What is troubling about this position, at least in the context of cable television, is its adjacency to the view that the first amendment secures only the right to speak, and its distance from modern theory that it secures, too, the right to hear.[8] The technology and economics of cable pretty much promise that, even absent regulation, a wide variety of views will be transmitted.[9] But, given the possibly disabling abundance of simultaneous information signals, it is not at all certain whether these views will be received by those interested in them. This latter issue is an important subject of first amendment inquiry.

II. PROPERTY AND REGULATION

In designing institutions for the future, there is a tendency to concentrate on the prospects for change in an institution's immediate area and to disregard prospective changes in other areas, changes that may hold important consequences for the institution being designed.[10] Carl Becker underscored the dangers to historical inquiry of a related tendency—to project into past worlds the preconceptions, climate of opinion, of the present one—in terms of the untrue analyses it produces.[11] This tendency, never entirely avoidable, is particularly dangerous when it becomes entangled in the design of legal institutions: perceptions here, unlike those of the historian, in fact shape the institution being perceived; the prophecies made are by nature self-fulfilling.

Because, in the nature of things, individuals called on to help in insti-

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other channel for local government use. . . . ¶ 122. *Public access channel.* It has long been a Commission objective to foster local service in broadcasting. To this end we have encouraged the growth of UHF television, and have looked to all broadcast stations to provide community-oriented programming. We expect no less of cable. . . . We believe there is an increasing need for channels for community expression, and the steps we are taking are designed to serve that need. The public access channel will offer a practical opportunity to participate in community dialogue through a mass medium. A system operator will be obliged to provide only use of the channel without charge, but production cost (aside from live studio presentations not exceeding 5 minutes in length) may be charged to users."

[7] Oppenheim, *Cable Television: Channels for Dissent*, 282 CIVIL LIBERTIES 1, 15 (1971).

[8] *See, e.g.*, A. MEIKLEJOHN, POLITICAL FREEDOM 26–28 (1965); Brennan, *The Supreme Court and the Meiklejohn Interpretation of the First Amendment*, 79 HARV. L. REV. 1 (1965).

[9] *See* text accompanying notes 49–50 *infra*.

[10] For an assessment of possible second order effects of a wide range of institutional and noninstitutional changes, see T. Gordon & R. Ament, Forecasts of Some Technological and Scientific Developments and Their Societal Consequences, Sept. 1969, at 58–98 (Institute for the Future Report R–6).

[11] *See* C. BECKER, THE HEAVENLY CITY OF THE EIGHTEENTH-CENTURY PHILOSOPHERS 1–31 (1932).

tutional design are usually drawn from among those involved with the present institutions to which the future conditions are seen as relating, heedlessness of change outside the institution's immediate area is likely to persist. For example, copyright lawyers, wedded to the notion that property is vital and inviolable, will quite naturally give property a central place in any future system of information production and distribution. And, for their part, regulators will place regulation at the threshold of restructured institutions. This general tendency marks two of the papers in this collection.

A. *Copyright*

In "Property Rights Under the New Technology," Professor Ralph Brown examines two questions involving the intersection between law and computer technology: first, the question of protection for computer programs, and, second, the question, "When a work protected by copyright is stored in a computer, at what point and for what uses must the property interests of the copyright owner be recognized?"[12] Reviewing the currently available sources of protection—patent, copyright, and trade secret law—Brown concludes that none, as presently designed, provides a particularly fitting shelter for computer programs, and, with considerable attention to the details of the interests involved, proposes an interesting copyright hybrid, providing expanded coverage but foreshortened term, to do the job.

On the second question, Brown clears away the considerable rhetoric that has formed the debate over whether input of a work into a retrieval system or output should constitute infringement, to discern the publishers' and users' fundamental fears. Publishers, he observes, are really concerned that "[o]nce books are introduced into computer networks, they may never reappear as books. They will be extensively used and will displace the need for the published work. But the use will be selective and the output fragmentary, in segments and forms that may each look like a fair use and that will be impossible to meter."[13] For their part, computer users "suspect that many authors and publishers may simply refuse access or set prices prohibitively high."[14] With a diffidence altogether fitting in the circumstances, Brown suggests that some form of compulsory licensing may be the solution.[15]

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[12] Pp. 200–01.

[13] P. 201.

[14] *Id.*

[15] In large part, Brown's attraction to the compulsory license mechanism stems from the high transaction costs, "the cost and inefficiency of getting clearances," that would otherwise obtain. There is no reason to suppose, however, that computer-based systems could not, and absent compulsory license mechanisms would not, themselves incorporate techniques that would produce, among other consequences, sharp reductions in transaction costs. A copyright proprietor might, for example, attach

Lawyerly and restrained, Professor Brown's analysis seems to me to miss some of the larger questions raised by the prospects for information systems and law's role in their management. There is, for example, his assumption that "[p]atent and copyright are where the action is,"[16] and that new subject matter and new uses ought to be brought under the governance of one or the other of these systems, rather than made the basis of more functional, tailormade laws. Brown's evidence contradicts his conclusions. The pains he takes to reshape copyright to fit the needs of computer programs argue more effectively for the enactment of a discrete program protection law. And, the admitted shortcomings of his attempt to resolve the software infringement question in strict copyright terms suggests that a better resolution might be achieved outside the copyright statute. What Brown's position ignores is that there is a limit to the kinds of tasks that the institution of property can perform efficiently and that some entirely different legal institutions may be called for, particularly in a context in which, in the words of one discussant, Professor, now Justice, Benjamin Kaplan, "we need facts: about types of programs, kinds and sizes of markets for the several types, and (a matter that needs intense examination) the transaction costs in terms not only of royalty payments but of the variegated expenses of search, negotiation, delay and frustration that would be incident to a copyright-bound or patent-bound regime."[17]

1. *Monopoly subsidies.*

Dissatisfied with the sort of protection the patent law would give to computer programs, Professor Brown favors instead the basis provided by copyright law:

> If the firm that develops a program at considerable cost or trouble deserves some protected head start, we should consider a limited broadening of copyright to

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to his input a flag and key indicating to the prospective user the proprietor's adoption of one of two positions: (A) his willingness to license uses at a specified rate, with the rate per use, per unit of information, indicated; or (B) his willingness to haggle over price on an ad hoc basis.

If position (A) is taken and the price is acceptable, then the prospective user will use the information and be charged accordingly, with the system itself administering billing and crediting. If the price is unacceptable, the prospective user will presumably forego use of the identified material and seek less costly alternatives. In either case, there need be no contact between proprietor and user, no search or bargaining, at any point. If (B) is the position taken, the problem of transaction costs is reintroduced. To be underscored, though, is that these costs will be lower than those that presently obtain: the prospective user will be provided with ready information as to the proprietor's whereabouts and his willingness to bargain, two elements, the first of search, the second of risk, the costs of which the user presently bears. At the same time, the present transaction costs to the proprietor—the costs of bargaining—will be unchanged. The first consequence puts the prospective user in a better position than he presently occupies; the second brings the two, proprietor and user, into a relationship more nearly approaching parity and probably would exert some pressure on the proprietor to choose mechanism (A) over (B).

[16] P. 204. The general patentability of computer programs has at least been placed in doubt by the Supreme Court's decision in Gottschalk v. Benson, 93 S. Ct. 253 (1972).

[17] Pp. 207–08.

> exclude unauthorized use, especially commercial use. Let us label this an *application right* . . . .
>
> An exclusive right to application of a developed program could be delimited by specific provisions for fair use and by admonitions that no idea, plan, or scheme embodied in the program was covered. It seems intuitively apparent that the application right should be of short duration—say five years.[18]

One wonders why Brown stopped here, enlarging one aspect of copyright with an "application right" and curtailing others—new fair use exceptions, abbreviated term—and did not go on to propose modifications elsewhere. Should the drastic measures of impounding and destroying infringing copies[19] be allowed, for instance, and what of the appropriate measure of damages? One wonders why Brown stopped short of some entirely new system for program protection.

Professor Brown's position belongs to a long, spunky tradition that says: if it needs doing, copyright will do it. Yet, significant, unbalanced costs may attend having copyright do it. With the exception of the few tailor-made provisions to be squeezed into the statute on their behalf, computer programs would necessarily be covered by the copyright law's whole cloth. Forsaken would be the high qualifying standards—for example, patent law's threshold requirements that subject matter for which protection is sought be new, nonobvious, and useful[20]—that might properly be required of program subject matter. Lost, too, would be the correspondingly high level of protection afforded, an objective that Brown seeks. At the same time, the presence of computer programs as a copyrightable class, together with whatever associated provisions would be introduced as essential, might dangerously distort copyright principles. Decisions rendered and doctrines applied in computer program cases could be expected to find their precedential way into decisions involving more traditional classes of copyright subject matter, decisions in which they would have no proper place.

This is not to suggest that there is some mystical unity to the classes of subject matter presently covered by the Copyright Act. The conditions surrounding the production of labels for goods, for example, may, freshly examined, indicate that for this presently copyrightable class,[21] the Trademark Act should be the exclusive federal regime. Rather, the suggestion is that, jerry-built, already encumbered by a welter of special interest provisions, the Copyright Act needs trimming, not fattening. Interests in both an efficient, orderly copyright system and in the maintenance of optimum conditions for the production and use of computer software, would, all else being equal, more likely be advanced by an independent statutory system for software protection, custom-made to fit the interests involved, than by a hybrid system incorporated in the Copyright Act, as Brown proposes.

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[18] P. 198.

[19] 17 U.S.C. § 101(c)-(d) (1970).

[20] 35 U.S.C. §§ 101, 102, 103 (1970).

[21] 17 U.S.C. § 5(k) (1970).

To be sure, all else is rarely equal, and political risks and economic costs may attend efforts to forsake an established system for a new one; as Brown notes, "my hunch is that it will be easier to adapt copyright than get a new statutory scheme. It is enough to change the copyright law. The general revision effort has been before the Congress since 1964, after lengthy preparation."[22] Yet, one reason reform has been stalled for so long is Congress' attempt to impose an encompassing copyright settlement on the technologically complex question of liability for CATV transmissions, a matter, in its administrative details, better suited to resolution through formulae both more refined and flexible than a copyright act can offer.[23] There are other arguments against fractionation, but Brown leaves these implicit. One argument is that the costs associated with the start-up and administration of new systems are wasteful. Another argument, that any erosion in rights and subject matter might impair this nation's treaty obligations, will perhaps prove compelling. There are other factors also to be considered as decisions on expansion or contraction of the copyright system are faced; none, however, has the force, assumed by Brown's stance, to foreclose consideration altogether.[24]

2. *Direct subsidies.*

Correct in his statement of the copyright system's basic question—"[*h*]*ow much* intellectual and industrial property (the power to affect price and output by excluding others) is necessary to direct the optimum commitment of resources to innovative activity"—Brown pays insufficient attention to the answers that lie in the world outside copyright's doors, the world, for example, of noncopyright subsidies.[25] These he gives a quick brushoff:

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[22] Pp. 205–06.

[23] *See* S. 644, 92d Cong., 1st Sess. § 111 (1971). The attempt to fit protection for asexually reproduced plant varieties into the general provisions of the Patent Act, 35 U.S.C. §§ 161–64 (1970), can be contrasted with Congress' more recent decision to lodge protection for sexually reproduced varieties in a separate, custom-made statute, the Plant Variety Protection Act, 7 U.S.C. §§ 2321–2583 (1970).

[24] Professor Brown's paper invites another, more radical, perspective on a principle that he quite accurately characterizes as axiomatic: "The overwhelming presumption in our society favors the freest possible dissemination and exploitation of information and knowledge." P. 191. Yet, as society's concern shifts from the promotion and dissemination of information to the future, more critical, task of channeling an overabundant store of information to fit highly particularized needs, copyright may appropriately be called on to serve an inhibitory, channelling function; to withhold protection from certain classes and forms of work whose production and distribution is seen as not socially useful. In part, this function is already assumed by copyright's ostensible refusal of rights to seditious, libelous, and obscene subject matter, the dissemination of which is socially disfavored. *See generally* Goldstein, *Copyright and the First Amendment*, 70 COLUM. L. REV. 983, 1028–29 (1970).

The limits of this approach, and its inclination to boomerang, are evident in the obscenity experience: the presence of independent, noncopyright incentives account for continued production in the field and, far from deterring dissemination, the law has, by immunizing infringement, at least theoretically encouraged it.

This suggestion, that the copyright system's inhibitory mechanisms may have an increased role to serve, is also open to the objection I leveled at Brown's tendency to press copyright into the service of any number of disparate causes: it may be asking the institution of property to do too much. The mechanism enjoys, however, a logical place in copyright's historic, central balance between incentive and access and warrants, at the least, more attention than it has so far been given.

> There are ways of stimulating innovation other than by conferral of property rights, notably by private and public awards to innovators and by public subsidies, either open or concealed. But in the absence of any developed system for supplanting patents and copyrights with prizes and other subventions, the computer and communications industries are not likely candidates for these forms of stimulation.[26]

Faced with a situation in which the transaction costs associated with obtaining permission to use information covered by copyright are prohibitively high, and the prospective use is socially valuable, Brown would presumably favor a compulsory licensing scheme—despite "the absence of any developed system" for its implementation—and ignore the possibility that the information's producer might have been persuaded to forgo copyright protection altogether as a condition of receiving government or private subvention for his work. Compulsory licensing schemes suffer their own administrative and private transaction costs, however, and, these aside, have little place in a property law of purportedly general application.[27]

Technical information will form a large part of the base of any future retrieval system, and the conditions surrounding its production and use suggest some of the benefits that may flow from employing already developed systems of subsidy as substitutes for copyright and, particularly, as substitutes for a copyright scheme that incorporates a compulsory licensing mechanism.[28]

Government and private subvention, not copyright, provide the economic support, and probably in part the incentive, for the production and distribution of the bulk of writings in this class—scholarly works, for example, or research reports in the natural and social sciences.[29] Other stimuli for production—scholarly reputation and academic advancement—are entirely unrelated to the copyright spur. And, to the extent that funding of these activities is by private institutions—foundations and universities—with private funds, there is no indication that the rewards to be yielded by the copyright monopoly play any role in the decision to fund.

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[25] P. 191.

[26] P. 192.

[27] More than a half-century's experience with the compulsory license mechanism of section 1(e) of the Copyright Act, 17 U.S.C. § 1(e) (1970), which was intended to counter a monopoly trend in the recorded music industry, has revealed it to be an awkward device, properly open to legislative proposals that it be excluded from the copyright law and administered on an ad hoc basis by the Federal Trade Commission or the Federal Communications Commission. H.R. 3456, 77th Cong., 1st Sess. (1941) (FTC); H.R. 10633, 75th Cong., 3d Sess. (1938) (FCC). The economic pattern that prompted section 1(e)'s enactment—the acquisition by a single manufacturer of perforated music rolls of the recording rights to a large part of the popular music of the day—was soon overshadowed by the development of the quite differently structured sound recording industry; and, despite the application of the mechanical licensing provision to sound recordings, the new industry displayed an unmistakable tendency toward concentration. STAFF OF U.S. COPYRIGHT OFFICE, STUDIES PREPARED FOR THE SUBCOMM. ON PATENTS, TRADEMARKS, AND COPYRIGHTS OF THE SENATE COMM. ON THE JUDICIARY, 85TH CONG., 1ST SESS., COPYRIGHT LAW REVISION, STUDY NO. 6, THE ECONOMIC ASPECTS OF THE COMPULSORY LICENSE 91, 109 (Comm. Print 1960).

[28] *See* B. KAPLAN, AN UNHURRIED VIEW OF COPYRIGHT 120–21 (1967).

Also, while the need for copyright may be low, its costs for prospective systems, in terms of blockages posed, would be high. In future modes for dissemination of technical information, the production of writings is likely to involve a continuous rather than a determinate activity. In the simplest system, the author will introduce his writing directly into a computer utility, updating and amending it from time to time; users' access to the work will begin at the time of introduction—which, in current parlance, would be the moment of first publication.[30] In more complex systems, users will also be "authors," verifying and augmenting the original author's contribution. The need in any such system for ready, on-line access and the complications posed by the continual addition of authors, indicate the impediments copyright would present.

The question is, then, given the role of government sponsorship and of other, noncopyright stimuli on the one hand, and the nature of the subject matter and the need for unfettered access on the other, what legitimate role has copyright to play in the production and management of technical information? Jettisoning this kind of subject matter from the copyright vessel is not the answer, principally because no clear line can be drawn between these works and those for which copyright will continue to serve its traditional functions: it is hard to mark a principled boundary between such works as technical compendia or bare biographical summary, on the one hand, and, say, a technical treatise or full biographical treatment on the other; indeed, the distinction is hardly different from that between "fact" and "nonfact" works, which has long resisted all attempts at delineation. Nor, for much the same reason, is it a satisfactory answer that because copyright protects expression, not ideas and facts, it grants only limited protection to technical subject matter, with the consequence that access to technical works can be expected to be correspondingly easy. The bare fact that a work is in copyright—whatever the extent of its expressive, protected content—will pose a uniformly high barrier to use. No court has found an entirely workable formula for administering the idea-expression distinction and it seems unlikely that engineers will have any better luck in designing screening devices to perform the task for an on-line system.[31]

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[29] *See* F. Machlup, The Production and Distribution of Knowledge in the United States 28 (1962).

[30] *See* D. Parkhill, *supra* note 2, at 164.

The general objective sought by the copyright system, increasing the national store of information, might for this class of subject matter better be reached outside the statute, through the inclusion in government and private grant policies of a requirement that copyright be waived as a condition to funding or, possibly, in the case of a university, as a condition to participation in an institution's activities. If, as appears, copyright provides little stimulus for the production of this sort of information, authors—and grantors, to the extent that they would otherwise become copyright proprietors—can be expected to waive copyright at a relatively low price.

Although this approach would probably not eliminate the copyright clog from all technical information produced, the presence in a system of even significant amounts of works in copyright need not stall it. To begin with, expressions of information are substitutable to a surprising degree, and if one work is not available, another often will do.[32] Moreover, for reasons just noted, this sort of subject matter can be extensively appropriated short of infringement and subsidized works, or works sponsored by the proprietors of the computer system, might be expected to accomplish the legitimate appropriation. And, as the number of a system's works without copyright approaches a critical mass, the rewards derived from the remaining copyrights can be expected to diminish. Finally, it is not unlikely that at least some of the future computer-based technical information systems will require as a condition of entry that copyright be waived just as government and private grants may be conditioned on a waiver of copyright. The system itself might be subsidized, although there is no immediately apparent reason for it to be financed any differently from other private service institutions.[33]

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[31] One reason disabling obstructions have not so far occurred in the related area of photocopying of technical materials is that users have blithely ignored the law's requirements: "The essence of the problem is that modern intra-library and inter-library loan systems and modern information clearinghouses—to the extent that they make use of copyrighted material—would not exist if the copyright law, including the court-developed concept of fair use, were adhered to. These systems depend on the delusion that it is lawful to reproduce from copyrighted material as long as only one copy of a text is made at a time, though there is nothing in Title 17 of the U.S. Code or any court decision that supports this belief." G. Sophar & L. Heilprin, The Determination of Legal Facts and Economic Guideposts with Respect to the Dissemination of Scientific and Educational Information as it is Affected by Copyright—A Status Report 24 (1967).

It can of course be argued that publishers' failure to secure relief from these practices, and the absence of any authoritative decision confirming their rights, constitutes an informal abrogation of rights that should be taken into account in any realistic evaluation of the system. A recent decision, expressly sustaining the rights of publishers in these circumstances, Williams & Wilkins Co. v. United States, 172 U.S.P.Q. 670 (Ct. Cl. 1972), deprives the status quo of even this comfort.

[32] In part, this will be a function of redundancy: "If a library holds two copies of the same book, one of them can be destroyed or exchanged without the system's losing information. In the language of Shannon's information theory, multiple copies make the library *redundant*. But copies are only one of three important forms of redundancy in information. Even if a library has only one copy of each book, it still has a high degree of informational overlap. If half the titles in the Library of Congress were destroyed at random, little of the world's knowledge would disappear.

"The most important and subtle form of redundancy derives from the world's being highly lawful. Facts are random if no part of them can be predicted from any other part—that is, if they are independent of each other. Facts are lawful if certain of them *can* be predicted from certain others. We need store only the fraction needed to predict the rest.

"This is exactly what science is: the process of replacing unordered masses of brute fact with tidy statements of orderly relations from which these facts can be inferred. The progress of science, far from cluttering up the world with new information, enormously increases the redundancy of libraries by discovering the orderliness of the information already stored. With each important advance in scientific theory, we can reduce the volume of explicitly stored knowledge without losing any information whatsoever. That we make so little use of this opportunity does not deny that the opportunity exists. Simon, "Designing Organizations for an Information-Rich World," p. 45.

B. *The FCC*

Just as to those involved in the discussion "Property Rights Under the New Technology," protection for property rights may have seemed "the hottest subject addressed in this series,"[34] for the participants in the discussion "Developing National Policy for Computers and Communications," government regulation, and particularly decisionmaking by administrative agencies, formed the center of attention. Among the issues considered were those raised at the beginning of FCC Commissioner Nicholas Johnson's main address:

> Who should make the decisions? Who should be permitted to influence the decision makers? To what extent should the decisions accommodate special interests? How should the public interest be represented? Should substantial new analyses of the issues be prepared by intellectually independent parties? Should decisions be in the form of integrated, long-term policy statements or in the form of case-by-case responses to applications and crises? Should the arguments presented to the decision makers and the reasons for their decisions be made public? Should it be possible for decisions to be appealed and reviewed?[35]

These, Johnson glibly asserts, "are strictly procedural questions"—his assumption apparently being that such questions exist—"and, as such, are not concerned with the substantive part of the issues, nor do they depend on whether the decisions are made by corporate executives or government officials."[36]

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[33] Indeed, the purpose of this discussion, generally, is to exemplify the role that can be played by noncopyright subsidies and is not to suggest that deployment of these subsidies will be essential to fluently functioning computer-based information retrieval systems. Any number of operable systems employing copyright inventories are conceivable. One, for example, might be controlled by an independent entrepreneur and subscribed to both by copyright proprietors and users. Royalties paid by the latter could be channelled to the former with deductions taken for the entrepreneur's account; pricing and billing might be conducted along the lines suggested in note 15 *supra*. Others might be controlled by publishers, either independently or as joint ventures. Brown observes: "The developing integration of publishers with computer interests may foreshadow networks built on major backlists, with copyrights used to beat off rivals desiring access to the same collection. This would bode ill for independent firms at all levels: nonintegrated publishers, software houses, and other emerging enterprises offering computerized information services to educational and business markets. Their profitability and survival will depend as much on cheap and ready access to inputs as on markets for outputs. These are causes for concern in the middle-range future. It is hard to flesh them out, and they may be kept thin by antitrust purges." Pp. 201–02.

[34] P. 190.

[35] Pp. 226–27.

[36] P. 227.

That the resolution of even "strictly procedural" questions is not without substantive consequence is amply evidenced by the bulk of Johnson's paper, largely devoted to a review and critique of the FCC's performance in the handling of "technological policy questions." In the matter of spectrum allocation, for example, Johnson observes that "the FCC has failed to come forward with the data and analysis necessary to avoid waste and promote the most rational allocation of frequencies . . . . [Y]ear by year studies accumulate asserting the need for a response to a growing national crisis. And year by year the FCC continues in essentially the same regulatory mold."[37] He chronicles, too, the Commission's bungling at the threshold of the decisionmaking involving color television standards and UHF implementation and its tardiness in facing the emerging issues of CATV and domestic satellite use, and concludes that with policy planning, "[a]s with the economic analysis of spectrum allocation, it is not that the FCC does it poorly, it does not do it at all."[38]

The Commission's inquiry into the intersection of the computer and communications industries[39] stands, for Johnson, "in marked contrast to its past inability to anticipate policy questions," and in many ways represents for him "the FCC at its best."[40] For Professor Richard Posner, however, the inquiry was, "to the extent it really was self-generated, premature and very largely a waste of time. It would appear to illustrate not a commendable initiative in attacking problems before they become serious, but the traditional anxiety of regulatory agencies toward unregulated activities that impinge upon the firms they regulate"[41]—the essentially unregulated computer service industry impinging on the pervasively regulated communications industry. What concerns Posner is Johnson's failure to address a critical threshold question: "It would promote clarity to ask at the outset why the government should concern itself at all with developments in the computer industry. Why not leave the provision and pricing of computer services to the free market, as with most products?"[42] The ensuing debate between Johnson and Posner boils down to a less satisfactory haggle: whether, when confronted with uncharted areas of emerging technology, the Commission acts best when it asks, as it did in the case of the computer, if regulation is needed—reserving as a possible conclusion that the correct decision is not to regulate—or when it abstains from action—both regulation *and* inquiry—altogether. One suspects that Posner was stalking a bigger issue.

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[37] Pp. 230–31.

[38] Pp. 233–34.

[39] Regulatory and Policy Problems Presented by the Interdependence of Computer and Communication Services and Facilities, 7 F.C.C.2d 11, 19 (1967).

[40] Pp. 234, 239.

[41] P. 244. Posner rests his objection to the Commission's approach in part upon his conclusion that, on the merits, "no particular regulations, planning, or other governmental initiatives are clearly dictated by the growing interaction of the computer and communications industries. I cannot demonstrate this rigorously, but there is enough reason for doubt to justify the position that those who would benefit from regulation, whether carriers or computer companies, should bear the burden of establishing a convincing case for it—something they have failed to do." *Id.*

[42] P. 242.

Bigger issues there are, particularly in the area of cable television. CATV's first appearance, tied to broadcasting's apron strings, like the emergence of computer service systems, with their need for communications links, posed the regulatory dilemma of an unregulated industry abutting a regulated one. Also, if given room to develop along the lines of their technological capabilities, CATV systems may eventually join with computer utilities and with satellite systems in forming integrated information networks. These prospects, not yet explored by the Commission, raise some fundamental questions of the extent to which an administrative agency whose governing legislation establishes only the most general policy guidelines should be permitted to retard or encourage the erosion of presently impacted systems. The questions invite brief examination, if only to demonstrate that once matters of "procedure" are disposed of, there is little of substance left to resolve.

Historically, the FCC's position on cable has been to reinforce the industry's symbiotic relationship with over-the-air broadcasting: by permitting some cable retransmission of over-the-air signals, the Commission has in effect put the broadcasting industry in a position of subsidizing cable's operations.[43] Although, after a long period in which it effectively curtailed the medium's growth, the Commission now seems inclined to loosen retransmission constraints and to encourage the development of the full range of cable's potential,[44] what may prove more debilitating to cable's prospects in the long run is the Commission's inability to settle on a structured model for governing the medium. The Commission has been attracted to aspects of both the broadcast model—indicated by cable's effects on, and similarities to, over-the-air broadcasting—and the common carrier model—indicated by cable's technical and natural monopoly contours—but the extent to which the structure eventually chosen will incorporate these or other mechanisms is uncertain. And, regardless of the structure it eventually adopts, the Commission appears no more certain of the needed mix, if any, between regulatory and market forces. Industrial and political pressures have complicated the Commission's tasks[45] and regulatory developments at the state and local levels promise to confound it further.[46]

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[43] By enlarging the over-the-air station's audience, on the other hand, cable transmission increases the base for the station's advertising revenues and, consequently, yields some rewards for the over-the-air broadcaster. These rewards, clear in instances in which the cable system functions to improve signal quality in the over-the-air station's locality, diminish as the signal is transmitted over a greater distance to the extent that the revenues of the over-the-air station are drawn from local advertisers.

[44] *See, e.g.*, Cable Television Service; Cable Television Relay Service, 37 Fed. Reg. 3252, 3270 (1972): "¶ 128. On review of the comments received and our own engineering estimates, we have decided to require that there be built into cable systems the capacity for return communications on at least a non-voice basis. Such construction is now demonstrably feasible. Two-way communication, even rudimentary in nature, can be useful in a number of ways—for surveys, marketing services, burglar alarm devices, educational feedback, to name a few. ¶ 129. We are not now requiring cable systems to install necessary return communication devices at each subscriber terminal. Such a requirement is premature in this early stage of cable's evolution. It will be sufficient for now that each cable system be constructed with the potential of eventually providing return communication without having to engage in time-consuming and costly system rebuilding. . . ."

Despite—or possibly because of—the haphazard nature of current regulatory approaches, there are lines of development in cable technology that, together with some of their effects on the market and on legal institutions, can be projected with a fair degree of certainty. It is likely that, to some significant extent, agencies and courts will fashion their decisions in this area to accommodate and even foster these developments and it is possible that, given their technological and economic force, these lines will surmount even some considerable body of administrative decisions that attempt to counter their development. This last point—that one of cable's effects may be to place itself above control by a body of administrative decision—is not contradictory: it suggests only that cable's effects on legal institutions may have a constitutional as well as a prudential bearing on regulatory policy.

1. *CATV: resource implications.*

Perhaps the single most important fact to be considered in projecting cable's potential impact on market and legal institutions is its technical difference from spectrum broadcasting. Unlike the electromagnetic spectrum, cable possesses a transmission capacity virtually unlimited by natural factors. Also unlike spectrum transmission, which is ideally suited to servicing mobile users, cable is by nature confined to transmission between essentially nonportable transmitters and receivers. These respective attributes suggest the economies that might lie in treating cable and spectrum as a single communications resource and in reallocating uses of the resource on a functional basis. For instance, the removal from spectrum to cable of signals transmitted between characteristically stationary transmitters and receivers—VHF and UHF television broadcast are two examples—might appear desirable, as might expanded use of the liberated portions of spectrum for land mobile services such as police and fire department and industrial dispatch transmission.

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[45] *See* Cable Television Report and Order, 24 P & F RADIO REG. 2d 1501, 1588 (1972) (Commissioner Johnson, concurring in part, dissenting in part). For a particularly perceptive analysis of the FCC's conception of the role to be played by cable, see Posner, *The Appropriate Scope of Regulation in the Cable Television Industry*, 3 BELL J. OF ECON. & MAN. SCI. 98, 124–26 (1972).

[46] *See generally* Barnett, *State, Federal, and Local Regulation of Cable Television*, 47 NOTRE DAME LAWYER 685 (1972).

It appears that the market, possibly with some Commission supervision, will provide the most fluent mechanism for reallocation of resource uses both in terms of reordering the present uses of spectrum and cable and, once reordered, in terms of determining what firms and institutions are to have access to each. This point is hardly new. It merely puts in broader context the longstanding arguments for replacing the present regulatory method of allocating spectrum use with one rooted in the market.[47] Because it would enlarge and consequently enhance the market's operation, incorporation of cable in the communications resource gives the arguments added conceptual force. Their wisdom notwithstanding, the arguments for introducing market factors into spectrum allocation have consistently failed to attract the support of Congress or the FCC, and this suggests that, even invigorated by cable economics, they may not prevail through legislative or administrative decision.

Absent legislative or administrative decisions favoring resource integration and introduction of a market basis, it is entirely possible that cable, unless its growth is sharply curtailed by government regulation, will on its own compel the evacuation of current VHF and UHF uses from the electromagnetic spectrum. A central consequence of spectrum scarcity and the presence in any locality of a restricted number of channels received is that, to survive competition, broadcasters must structure their message to appeal to the largest possible audience.[48] This accounts, of course, for the orientation of television programming to what is often characterized as the lowest common denominator in the national audience but is, in fact, more in the nature of an average and, as such, probably reflects the precise program interests of relatively few: just as there are some television viewers who would prefer less violence on their sets, so there are some who doubtless would prefer more; for some the flurry of quiz and game shows is a glut, for others not nearly enough. Cable possesses the technical capacity to attract, through separate channels, the highly particularized interests of the many minorities that now make up over-the-air broadcasting's averaged majority. Given the prospects for national cable networking through use of domestic satellites, the storage and retrieval possibilities of electronic video recording, the interests of advertisers in exposure to more defined markets at a lower overall cost and, in many cases, the willingness of subscribers to pay directly for what they receive over the cable, the economic prospects also appear strong. If the role to be played by CATV in local and regional political and service programs is added to this,[49] together with the critical constant of a finite number of hours of viewer time, the prospects for attenuation in the role of VHF and UHF broadcasting become clear.[50]

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[47] *See* H. Levin, The Invisible Resource: Use and Regulation of the Radio Spectrum (1971); Coase, *The Federal Communications Commission*, 2 J. Law & Econ. 1 (1959); *cf.* President's Task Force on Communications Policy, Final Report ch. 8, at 28–40 (1968); DeVany, Eckert, Meyers, O'Hara & Scott, *A Property System for Market Allocation of the Electromagnetic Spectrum: A Legal-Economic Engineering Study*, 21 Stan. L. Rev. 1499 (1969).

[48] Prospects for program diversification by UHF broadcasting were stunted by the FCC's failure, at the new industry's outset, to posture it competitively with the entrenched VHF industry and, once the disabling effects for UHF of this posture became evident, by the Commission's temporizing, wholly inadequate interim solutions. *See generally* Note, *The Darkened Channels: UHF Television and the FCC*, 75 Harv. L. Rev. 1578 (1962). It has been persuasively argued that the All-Channel Television Receiver Law, 47 U.S.C. § 303(s) (1970), designed to bolster UHF use, has had few beneficial effects for the industry, and still fewer for the public and that, given the industry's present state, other diversification alternatives, such as those posed by CATV expansion, are more desirable. Webbink, *The Impact of UHF Promotion: The All-Channel Television Receiver Law*, 34 Law & Contemp. Prob. 535 (1969).

2. *CATV: constitutional implications.*

It is evident also that the growth of cable, whatever the form and source of its eventual accommodation to the presently entrenched system, will at some early point require, first, reconsideration of the constitutional posture of a large area of FCC regulation and, second, consideration of the need for regulation in at least one presently untouched area. The first area involves the Commission's regulation of broadcast content: simply, the notion that has traditionally provided the constitutional premise for the Commission's actions in the area—that it is a scarce resource that is being regulated—no longer obtains. Second, as the amount of messages transmitted expands from a number bounded by the constraints of spectrum to one measured by the far more commodious ambit of cable, some aspects of the regulatory task will alter. While an objective of regulation will still be the public's reception of a socially useful range of information, the means for attaining the objective will have to change from rules designed to cram this range into a limited transmission capacity to rules designed to facilitate informed viewer choice of programs and services from among the multitude offered.

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[49] *See* text accompanying notes 101–02 *infra*.

[50] PRESIDENT'S TASK FORCE ON COMMUNICATIONS POLICY, *supra* note 47, ch. 7, at 41–42, makes a more conservative appraisal of cable's impact, at least for the short term: "It is important, therefore, to determine the likely impact of cable development on our over-the-air system. Our studies do not indicate that there would be a serious competitive injury to affiliates of the major national networks, which carry the most popular programs, or to independent VHF stations which are, by and large, well established. The same should be true of UHF stations which obtain network affiliation, a development depending chiefly on the extent of UHF receiver penetration in the particular market. When speaking of expansion in this context, therefore, we mean primarily the continued development of independent (non-affiliated) UHF stations." The Report is not altogether clear, though, as to whether its findings presuppose a cable system engaged only in signal retransmission or one engaged in substantial program origination with advertiser or subscriber support. It seems likely that it contemplated the first sort of system, the impact of which would be considerably less than that of the second. *See also* Comanor & Mitchell, *The Costs of Planning: The FCC and Cable Television*, 15 J. LAW & ECON. 177, 183–88 (1972); Park, *The Growth of Cable TV and Its Probable Impact on Over-the-Air Broadcasting*, 61 AM. ECON. REV. 69 (1971).

Although there is little information on the potential of over-the-air subscription television systems for siphoning programs and talent, and consequently audiences, from over-the-air "free" TV, there seems to be general agreement that siphoning will occur at some level. "Of the various arguments raised by STV opponents, we find that of so-called selective program siphoning most persuasive. It is at least conceivable that a successful nationwide STV system, even though possibly not having as much money as free TV to spend for program product, could, by directing its purchases at select programs, *e.g.*, the World Series or professional football games, take them from free TV and require the huge audiences of those programs to pay to see them or not see them at all." Committee Report on STV, 10 P & F RADIO REG. 2d 1617, 1661 (1967). The committee apparently recognized that the siphoning effects of cable-based, as opposed to over-the-air, STV systems would be considerably greater. *Id.* at 1725–28. The Commission's 1972 rules tightly restrict CATV conversion to an STV basis. *See* 47 C.F.R. § 76.225 (1972).

The constitutional issue, though long ripe, has been consistently ignored. In another context, discussing the standards to be applied by the FCC in reviewing broadcast licenses, Commissioner Johnson noted that "the FCC is prohibited from censorship of broadcasters, and we have personally expressed our distaste for all forms of censorship many times," and asserted:

> If the broadcaster is to continue as a "trustee" of public property, he must be accessible to the community and reasonably responsive to its needs and wishes. He must be willing to motivate and inspire the public, as well as to entertain it. He must practice journalism that, while it is free, serves the community that supports it. To be responsible, a broadcaster in modern society needs to televise more than network reruns and old movies interspersed with countless appeals to the viewers' pocketbooks.[51]

Considerations of this sort, together with those that underlie the Commission's fairness doctrine[52] and the statutory equal time prescription,[53] may appear to serve eminently worthwhile objectives. But this should not obscure the fact that, no less than censorship, they impose upon broadcasters a governmental judgment respecting types of subject matter appropriate for dissemination, a judgment that would not, for instance, easily be accepted in the context of newspaper or magazine publication.[54]

Justice Frankfurter stated the classic rationale for this imposition in *NBC v. United States*:[55] "Freedom of utterance is abridged to many who wish to use the limited facilities of radio. Unlike other modes of expression, radio inherently is not available to all. That is its unique characteristic, and that is why, unlike other modes of expression, it is subject to governmental regulation."[56] Fitting in the context of the then existing technology, the rationale has not been examined in the light of modern conditions. In *Red Lion Broadcasting Co. v. FCC*,[57] for example, the

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[51] Johnson, Book Review, 23 Stan. L. Rev. 173, 192–93 (1970).

[52] *See generally Editorializing by Broadcast Licensees*, 13 F.C.C. 1246 (1949); *Applicability of the Fairness Doctrine in the Handling of Controversial Issues of Public Importance*, 29 Fed. Reg. 10416 (1964).

[53] 47 U.S.C. § 315 (1970).

[54] *Cf.* Weaver v. Jordan, 64 Cal. 2d 235, 411 P.2d 289, 49 Cal. Rptr. 537, *cert. denied*, 385 U.S. 844 (1966), in which the California supreme court struck down the state's "Free Television Act"—which undertook to ban the business of home subscription television—as an abridgement of the free speech guarantees of the state and federal constitutions.

[55] 319 U.S. 190 (1943).

[56] *Id.* at 226. Even in its immediate context, the full logic of Justice Frankfurter's position was not the happiest. As Professor Kalven has observed, "[t]he passage catches a great judge at an unimpressive moment." Kalven, *Broadcasting, Public Policy and the First Amendment*, 10 J. Law & Econ. 15, 43 (1967).

[57] 395 U.S. 367 (1969).

Court gave the classic response to petitioner's argument that imposition of the Commission's fairness doctrine violated its first amendment rights:

> Otherwise, station owners and a few networks would have unfettered power to make time available only to the highest bidders, to communicate only their views on public issues, people and candidates, and to permit on the air only those with whom they agreed. There is no sanctuary in the First Amendment for unlimited private censorship operating in a medium not open to all.[58]

With the observation that "[s]carcity is not entirely a thing of the past,"[59] and couching its answer exclusively in terms of the spectrum resource, the Court specifically rejected petitioner's argument that "even if at one time the lack of available frequencies for all who wished to use them justified the Government's choice of those who would best serve the public interest by acting as proxy for those who would present differing views, or by giving the latter access directly to broadcast facilities, this condition no longer prevails so that continuing control is not justified."[60] The Court's failure even to mention cable's implications for the scarcity predicate is particularly curious in view of its remarks in two decisions rendered the previous term on the new technology's bold prospects.[61]

The facts underlying *United States v. Midwest Video Corp.*,[62] a case decided just last term, moved one step closer to the center of the question of cable's implications for the continued vitality of the scarce resource rationale. Involved in *Midwest Video* was petitioner's challenge to an FCC rule that, to be permitted to retransmit broadcast signals, any CATV system with 3,500 or more subscribers must also, to a significant extent, engage in "cablecasting."[63] Sustaining the Commission's authority to require that cable systems undertake program origination, the Court came close to uncovering the scarce resource dilemma:

> To be sure, the cablecasts required may be transmitted without use of the broadcast spectrum. But the regulation is not the less, for that reason, reasonably ancillary to the Commission's jurisdiction over broadcast services. The effect of the regulation, after all, is to assure that in the retransmission of broadcast signals viewers are provided suitably diversified programming[,] the same objective underlying regulations sustained in *National Broadcasting Co. v. United States* . . . as well as the local carriage rule reviewed in *Southwestern* and subsequently upheld.[64]

Because, unlike *Red Lion*, *Midwest* did not directly involve Commission regulation of content, the Court was not forced to face the scarce resource issue squarely.[65] In a case combining the context of *Midwest* with the issue of *Red Lion*—a case involving, for example, application of the fairness doctrine to cablecasting—the question would be hard to avoid.[66]

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[58] *Id.* at 392.

[59] *Id.* at 396.

[60] *Id.*

[61] Fortnightly Corp. v. United Artists Television, Inc., 392 U.S. 390 (1968); United States v. Southwestern Cable Co., 392 U.S. 157 (1968).

[62] 406 U.S. 649 (1972).

[63] 47 C.F.R. § 76.201 (1972).

[64] 406 U.S. 649, 669 (1972).

None of this is to say that, with cable's emergence and the consequent erosion of the scarce resource rationale, both broadcasting and cablecasting will fall entirely beyond the Commission's constitutional reach. There remains considerable room for government regulation of other than content, regulation of the sort sustained in the context of newspaper publication[67] and, in fact, in both the *Midwest* and *Southwestern* cases. Nor is this to suggest that the Commission will not continue to have an important role to play in encouraging the realization of first amendment objectives. The new fact of abundance in the transmission resource simply underscores the dwindling need for promotion of diversity at the source and the increasing need for filtration at the point of reception.

The prospects for an information-rich transmission environment are now too distant, and the literature on the attendant needs for filtration devices too sparse, for any prudent forecast to be made either about the procedures and programs that will or should be employed to encourage informed viewer choice, or about the mix of regulatory and market mechanisms that implementation will or should entail. The daily newspaper's television page, *TV Guide*, and program advertising broadcast throughout the day presently serve the former function and it is possible that, with some alterations in format, they will continue to serve it. One channel might, for instance, be devoted entirely to providing information on the programs and services available on the other channels. As noted in the discussion of privacy below, the more distant future may promise a computer-based system which, fed with data describing the viewer's full range of interests, will on demand or from time to time feed back individualized schedules of programs and services falling within the described range.

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[65] Although at one point in its opinion the Court acknowledged the content effects of the program origination rule, it finessed the issue by a comparison to rules aimed at technical quality: "In essence the regulation is no different from Commission rules governing the technological quality of CATV broadcast carriage. In the one case, of course, the concern is with the strength of the picture and voice received by the subscriber, while in the other it is with the content of the programming offered. But in both cases the rules serve the policies of §§ 1 and 303(g) of the Communications Act on which the cablecasting regulation is specifically premised . . . and also, in the Commission's words, 'facilitate the more effective performance of [its] duty to provide a fair, efficient and equitable distribution of television service to each of the several States and communities' under § 307(b)." *Id.* at 669–70.

Justice Douglas, dissenting, dismissed this in a footnote: "In light of the striking difference between origination and communication, the suggestion that 'the regulation is no different from Commission rules governing the technical quality of CATV broadcast carriage' . . . appears misconceived," *id.* at 678 n.1. The dismissal was made without reference to the constitutional issue.

[66] Close analogues of both the fairness and equal time requirements have been imposed by the FCC upon CATV systems engaged in cablecasting. 47 C.F.R. §§ 76.205, 76.209 (1972). "[T]he requirement that broadcasters present both sides of controversial issues of public importance—an obligation inherent in the public interest standard and properly imposed on broadcasters by the Commission to implement congressional policy (Red Lion Broadcasting Co. v. FCC, 395 U.S. 367, 379–86), would be grossly circumvented if the CATV subscriber receives both sides when he tunes his television set to a broadcast channel at a time when broadcast program material is being presented but only one side when he switches to a CATV origination channel or stays tuned to the broadcast channel at a time when CATV origination has been substituted for deleted broadcast material." Experimental, Auxiliary, and Special Broadcast and Other Program Distributional Services, First Report and Order, 34 Fed. Reg. 17651, 17658 (1969).

[67] *See, e.g.*, Citizen Publishing Co. v. United States, 394 U.S. 131 (1969).

III. Individual and Society

Prediction and planning are typically confined to first order, systemic effects—what adjustments will be needed for the copyright system to function smoothly, for example, or for the FCC to behave responsively—and too rarely consider the possible second order effects for the life of individuals and of society at large. Although it is perhaps these covert effects that are most in need of examination, it may be helpful as an introductory step to shift focus and consider law's role in designing institutions whose impact on individual and social life belongs quite explicitly to the first order.

A. *Privacy*

Professor Alan Westin's paper, "Civil Liberties and Computerized Data Systems," gives a useful synoptic review of the interests, individual and governmental, involved in the protection of privacy; identifies their place in two competing political traditions; and proposes some largely unexceptionable mechanisms for the adjustment of these interests in the context of modern information systems. The treatment is in one respect narrower and in one respect broader than usual privacy discussion: Westin confines himself to government data systems and treats due process as "an issue distinct from privacy in the protection of civil liberties."[68] His concept of privacy, on the other hand, is the one customarily employed: "Privacy is the right to determine what information about oneself to share with others."

By way of introduction, Westin traces modern data systems to their origins in the "administrative surveys" early employed in tax collection and military conscription, in the "intelligence systems" employed by the "Spartan secret police, the *frumentarii* of imperial Rome, the agents of the Spanish Inquisition and the royal regimes of the early nation-state," and in the "statistical systems" that "resulted from the institutionalized separation of administrative from statistical functions in the nineteenth century."[69] Noting the effects for these systems of the 20th century blossoming of social welfare and educational programs and government surveillance activities, Westin observes:

> The nineteenth century rules of privacy and due process were not abandoned during this period, but collection of personal information rose steadily, access to

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[68] P. 151.
[69] Pp. 153-54.

> files by the citizen became more difficult, and information began to seep through the walls between administrative intelligence and statistical systems.[70]

Westin identifies three successive stages of data system development in the years between 1955 and 1970: the computerization of files, the data bank, and the centralized computer service with data bank. He projects for the period 1970–85 a pattern marked by increases in the substantive and geographic integration of systems; the likelihood of seepage between administrative, intelligence and statistical compartments, he appears to conclude, will increase correspondingly.

Westin proposes as one safeguard for interests in privacy an enforced, systematic separation of the three classes of information:

> Different functions are served by administrative, intelligence and statistical systems, and each requires its own set of rules and procedures. I believe that keeping the three types separated inside computerized data systems (as can be done technologically) and in the output of these systems is still the best primary measure for protecting civil liberties.[71]

Although discussant Charles Schultze suggests that data can be more helpfully categorized in terms of the uses to which they are put—"personal use," to "gain knowledge about specific individuals or institutions," and "statistical use," to "gain knowledge not about particular persons but about *classes* of individuals and institutions"[72]—like Westin, he assigns a not insubstantial value to the interests in efficiency purportedly served by data systems and would probably reject the suggestion that sharp restrictions on the amounts and types of information fed into the system represent the only real safeguard.[73]

In his concluding paragraph, Westin suggests as another possible safeguard a modern counterpart to the writ of habeas corpus: "a writ of habeas data, commanding government to produce and justify the use of information it has stored in the recesses of a computerized data system on which it is basing judgments about the individual."[74] Although this suggestion may have been made with tongue in cheek, as Professor Arthur Miller has suggested,[75] I think that Westin may also have had a more serious proposal in mind: the implementation of mechanisms through which an individual could at any time examine his full dossier, identifying errors and omissions and securing their correction, if necessary, through appropriate appellate procedures.

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[70] P. 155.

[71] P. 165.

[72] P. 168.

[73] *See, e.g.*, Countryman, *The Diminishing Right of Privacy: The Personal Dossier and the Computer*, 49 TEX. L. REV. 837, 869 (1971): "The only hope for substantial protection of privacy against the computerized dossiers, therefore, is that they not exist—at least that they not exist on the present scale. And if the 'legitimate need' for the dossiers were appraised as an actual need for a vital public service, rather than as a convenience or a comfort for any acceptable purpose, the great bulk of existing dossiers could be eliminated and the growth of dossiers in the future drastically curtailed. Careful study of the contents of various compilations, and careful consideration of the justification therefor, would be required before lines could be drawn. But it seems apparent that a rigorous application of the test of actual need for a vital public purpose would drastically clear the files."

[74] P. 168.

[75] A. MILLER, THE ASSAULT ON PRIVACY 216 (1971).

At least two of the assumptions in Westin's paper, both drawn from the mainstream tradition of modern privacy literature, are open to question: the assumption that privacy is a vital personal interest and must for the good of society be valued at significant costs, and the apparently contradictory assumption that, despite its particularity and value, an individual's privacy is not to be treated as a commodity, disposable by the individual as he deems best.

Early in his paper, Westin rehearses the traditional rationale for the protection of privacy. Privacy, he states,

> is crucial to a free society because, (1) it nurtures the development of self-reliance and self-realization of the individual citizen; (2) it protects the innovative and critical role of private organizations, especially in a pluralistic culture; and (3) it shields valuable areas of social and political life from supervision by authority, thus working against the rise of totalitarianism.[76]

This sounds good, but I am not sure that it will withstand close scrutiny. To the extent, for example, that these terms have substantive meaning, it is not at all clear what relation privacy bears to the "innovative" and "critical" role of private organizations, what relation these bear to a "pluralistic culture," and what relation all bear to a "free society."

Perhaps more important, it is not self-evident that these propositions are empirically supportable. It would be interesting to see the several assertions made in propositions (1) through (3) subjected to testing in the world, to determine, for example, in what ways, if any, privacy does indeed nurture the development of self-reliance in the individual citizen; it would be interesting, too, to get some facts on just how, if at all, propositions (1) through (3) relate to the maintenance of a "free society." Westin has recently taken a needed step in this direction, analyzing the results of several public opinion surveys on computers, privacy, and recordkeeping. His analysis concludes, however, with the acknowledgment that "[w]e have yet to see the large-scale empirical study of what privacy means to people—a study which would have to probe much deeper than the opinion poll is usually designed to do."[77]

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[76] P. 152.

[77] A. Westin & M. Baker, Databanks in a Free Society 485 (1972). Perception of this need underlies discussant Ralph Nader's unease with Westin's presentation: "I do not believe we are ever going to get functionally applicable answers to such questions as these unless we root our concepts and distinctions in empirical case studies about the liberties and tyrannies found in different situations. Such inquiries, incidentally, might help resolve the tremendous tension between the two points of view and maximize the massive benefits that proficient information systems can produce for health, safety, allocation of resources, and social welfare." P. 174.

Putting these issues aside, and assuming with Westin that protection of privacy does possess some social utility, there is a second question respecting treatment of personal information that deserves more attention than it has so far been given: by what method is the balance between interests in gaining access to this information and interests in guarding access to be struck? Lacking facts, I cannot fault Westin on the basis of the balanced result he would reach in any particular case. My concern, rather, is with the inconsistency that marks his characterization of the interests on each side. The first interest, in gaining access to information, Westin would measure in terms of the information's immediate utility to the prospective user. A logical counterpart measure would, for the second interest, calculate the immediate utility to the individual whom the information concerns of granting access to the information. Westin, however, characterizes the second interest not in terms of individual utility but, rather, in terms of a uniform set of political values; utility, to the extent that it has a place in the calculation of this second interest, is highly derivative, relating only to some generalized societal advantage.

It would seem far more efficient and responsive to the interests involved if, just as the first interest is measured in terms of the utility to the individual user of possessing the information, so the second interest would be defined by the utility to the individual whom the information concerns of divulging the information to the prospective user. This calls only for the introduction of market mechanisms into this corner of information dissemination. There is no reason to expect that the market will function any less efficiently in this area than in others, and that it will not at the same time safeguard those personal interests that Westin assumes to be dear. Indeed, viewed in a market context, the sorts of safeguards he proposes appear particularly stingy and not at all sensitive to the values of "self-reliance and self-realization in the individual citizen" they purport to secure. Enjoining users from access to a defined range of information, Westin's safeguards would bar individuals from ever realizing economic value from this information. A market-based system would give the individual, and not a political body, the choice between withholding the information—the most that the individual can achieve under Westin's system—or divulging it at a price.

In the case of government or private data gathering for purposes of describing and evaluating behavior, the price may be paid in dollars. In a computer-based marketing system designed to provide sellers of goods and services with highly particularized consumer information, and to provide prospective purchasers with information respecting the source of goods and services which particularly fit their interests—as their interests are expressed in dossiers on them contained by the system—the dividend may be paid in the form of more highly detailed product and service information. Assume, for example, that in the context of such a marketing system *A* values his privacy highly or has little desire for information respecting goods and services fitting his specific interests, while *B* places a low value on his privacy or has a high desire for information. *A* will probably feed little, if any, information into the system and will get back little in the way of product and service information, while *B* will probably find it in his interest to introduce into the system a substantial amount of information respecting himself and will get back commensurately detailed information. In any case, there will be some correspondence between the amounts of information put into and received from the system.

It should be evident from this that, at least in the case of computer-based marketing systems, the personal tradeoffs involved are not unlike those commonly made in daily life. Limitations will, of course, be called for, but these need be no more intrusive than those employed elsewhere in the marketplace to assure that the conditions under which competition exists and transactions are conducted are fair. Thus, for instance, the question whether personal information can ever be volunteered, given freely, so problematic to some,[78] can in any case be answered in terms of competence and of the rules applied to adhesion contracts generally. Criminal procedure, which often finds far more sensitive, and constitutionally guarded, interests at stake, also tolerates and provides guidelines for knowledgeable waiver in many instances. Also, there must be requirements for clear and complete disclosure by prospective users of the uses to which the divulged information may be exposed. And, there must be guarantees that the information divulged will be put to no uses, and made available to no users, falling outside the scope of the waiver. But, this is a matter of security, not privacy; available software, together with appropriate legal sanctions, can be employed to this end.[79]

Certain lines may have to be drawn, too, identifying areas of information and use respecting which the individual is to be barred from choice altogether: areas and uses for which the individual should have no alternative but to divulge, and those for which he should not be allowed to divulge under any circumstances, at any price. Information of the sort garnered by the national census may well fall into the first class. The second class would include information which, if revealed, might entail harm to an individual's mental health or to the integrity of the social fabric. In part, however, prohibiting disclosure of information in the second class may be compared to criminalizing victimless conduct, and emerging constitutional limitations may apply here, too. And, given the potential for abuse when personal information is disclosed as a condition to receiving some governmental benefit, such as an occupational license, care will have to be taken to assure that unconstitutional conditions not go uncorrected.

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[78] *See, e.g.*, Countryman, *supra* note 73, at 866.

[79] Consider, for example, Professor Miller's suggestion that, "[i]f we are to do more than pay lip service to the right of informational privacy, the law must impose a duty of care on the data gatherer that is commensurate with the degree of coercion or pressure under which an individual yields control over personal data." A. MILLER, *supra* note 75, at 187.

B. *Opportunity*

Data-based information networks promise to increase law enforcement's efficiency, but may do little or nothing to remedy the cause of crime. By effectively focusing resources on the apprehension of criminals, for example, these systems might relieve existing pressures for removal of the conditions causing criminal behavior. Training centers employing programs of computer assisted instruction, augmented by novel video techniques, to teach occupational and survival skills to the poor, may soon dot the central cities. Unless, however, needed resources are applied to bettering presently deficient transport systems in these areas, the cost of reaching these centers may be prohibitively high for many of those most in need of their services. In short, although some of the burgeoning information technologies' rosier aspects reflect bright opportunities for the poor to gain access to the economic and social mainstream, future information systems may in fact hold few such prospects and, indeed, if left to their present patterns of development, seem just as likely to enlarge present divisions between the haves and have-nots.

Some not unlikely projections indicate, for example, that one consequence of the widespread implementation of CATV systems with subscriber-supported programming may be exclusion of the poor from access to their messages. The significance of this exclusion is underscored by the possibility of the concurrent decline, and possibly disappearance, of today's "common denominator" programming.[80]

To begin with, although income-based disparities in access to two of the most significant present communications modes, telephone and broadcast television, are comparatively low,[81] it would be wrong to predict from this that income-based disparities in access to CATV will be similarly low, not necessarily because unit cost of access to hardware will be higher—although there is some evidence that it will be—but because in CATV systems it will be the cost of access to programming, not the cost of access to hardware, that poses the critical threshold. Everyone with a telephone has access to the messages it carries and to its capacity for sending messages, and—long distance and message unit charges aside—this access involves no charge to the consumer above the fixed charges incurred for installation and monthly service. By the same token, once a television set is purchased—repair, electricity and depreciation costs aside—the broadcast programming is received "free," although, of course, a tax is levied by television advertisers in the form of augmented price of goods and services, and the tax is a regressive one at that.

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[80] *See* text accompanying notes 82–83 *infra*.

[81] *See* Bureau of the Census, Current Population Reports, Consumer Buying Indicators, Special Report on Household Ownership of Cars, Homes and Selected Durables: 1970, 1969 and 1960, table 6 (Series P-65, No. 33, 1970); Bureau of the Census, Current Population Characteristics, Characteristics of Households with Telephones, table 1 (Series P-20, No. 46, 1965).

It seems likely that whatever income-based disparities there are in access to telephone and television will be magnified in a system of the sort CATV will afford, in which a significant part of user cost will be directly tied to the frequency with which messages are received. A large fraction of cable's many channels will probably be occupied by subscriber-supported programming and, absent subsidies, one consequence will be exclusion of the poor from access to these programs.[82] Also, although advertiser-sponsored programming will certainly not disappear with the demise of common denominator programming, advertisers can be expected to adopt the distribution method presently employed by controlled circulation magazines; confining dissemination to the chosen audiences can be accomplished by use of the blocking devices employed by subscription television systems or, more likely, by purchasing time only on cable systems situated in high- and middle-income areas. To the extent that advertisers do not adopt the controlled circulation method, the poor would have access to this programming, just as the poor may on occasion be willing and able to pay the price for pay TV. The crucial question is whether these slim pickings will be sufficiently attractive to the poor for them to incur the necessary hardware and associated connection charges, if in fact they will have the resources to meet them. And underlying all of this is an even more prob-

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[82] There is scant data on STV experiments. Although the data generated by the trial STV operation in Hartford, Connecticut, which began operation in 1962, is of questionable value for purposes of prediction, one set of figures produced is of interest:

4633 HARTFORD SUBSCRIBERS

Income Levels	Proportion of Total U.S. Families	Proportion of Total Subscribers	Average Weekly Program Expenditure
0 – $3,999	29.1%	1.5%	$0.00
$4,000 – $6,999	32.5%	40.8%	1.25
$7,000 – $9,999	21.0%	43.3%	1.23
$10,000 and over	17.7%	14.4%	1.18

Committee Report on STV, 10 P & F RADIO REG. 2d 1617, 1647 (1967). These figures were introduced by STV's proponents to counter the charge "that STV would be something which only the very wealthy could afford," *id.*, but apparently not to controvert the charge that it would be priced beyond the reach of the poor or, at least—and this may be all that these figures represent—that the STV operator would have little interest in advertising his services to the poor.

lematic assumption: that locales heavily populated by the poor will be wired for cable at all.[83]

While in other areas the nature of the new technologies' impact on the lives of the poor is more questionable, their prospects for enlarging human opportunity may be indicated by brief consideration of three areas—education, work, and politics. Many of the institutional boundaries that today structure educational, occupational, and political activities will, in the coming age, shift and in some cases disappear entirely. Themselves transformed, schoolhouse and university may at several important points tie up with business and industry to give the individual the opportunity to obtain education throughout his career rather than just at its beginning. The geographic and economic loci of political power may also shift. Change in these areas will most likely be a product not of the new communications technology as it is specifically directed at the area involved—new teaching devices in the area of education, for example—but rather of the pervasive changes in the structure of society generally. Professor James Coleman makes this point at the outset of his paper, "Education in Modern Society": "The indirect impact of changes in the communication structure of society has been and will be so great that the technological changes in the schools themselves must take place within the new frame that these developments will create."[84]

1. *Education.*

The central and most provocative line of thought in Coleman's fine paper begins simply enough:

> Not many years ago a child obtained most of his information from direct experience. It was information restricted largely to his family, neighborhood and community. It was supplemented by a few windows to the outside world opened by reading material at home or in school. This reading material provided vicarious experience which extended a child's horizons beyond his direct experience.[85]

Early the prime institution for relaying vicarious experience, the school has been—and increasingly will be—overshadowed in this function by the emerging media: "That function is radically altered by television, radio, and other media outside the school. Vicarious experience is no longer a slowly developing supplement to direct experience, but an early and large component of the child's total experience."[86]

Also overshadowed is the school's capacity to shape values by excluding certain information, interpretations of events, from the student's view: "The information pluralism to which children in modern society are exposed removes the school's shaping of values through selectivity."[87] And, probably most important from Coleman's point of view, the increases in vicarious experience have been at the expense of direct experience. Their time absorbed so completely by the media and their schools, children have little chance to try themselves in the world.

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[83] *See* McGowan, Noll & Peck, *Prospects and Policies for CATV*, in SLOAN COMM. ON CABLE COMMUNICATIONS, *supra* note 2, at 215–16.

[84] P. 116.

[85] *Id.*

[86] P. 118.

Coleman sees in computer and communications technologies enhanced methods for imparting information out of school: "there is no inherent reason for a student and computer terminal to be in a classroom with other students and terminals."[88] Technology's freeing of geographic limits also contains possibilities for advancing equality of educational opportunity. Referring to the findings of the Coleman Report,[89] of which he was the principal author—that the "inequalities with the greatest effect on learning" were not in the resources of the schools attended by blacks and whites, but, rather, "were in the child's *social* environment . . . and the verbal skills of the teacher"[90]—Coleman observes that "Computers can confront a child with a different environment and impose demands on him that his local environment does not."[91]

At the same time, Coleman recognizes the need for redressing the present imbalance between amounts of vicarious and direct experience available to students. "The external environment can now take over many of the classical functions of the school, but there is nothing to take over the classical functions of the nonschool environment"[92]—nothing, that is, but the school itself:

> The school of the future must focus on those activities that in the past have largely been accomplished outside school: first, productive action with responsibilities that affect the welfare of others, to develop the child's ability to function as a responsible and productive adult; and second, the development of strategies for making use of the information richness and information-processing capabilities of the environment. The activities that have been central to the school's functioning, such as expansion of students' factual knowledge and cognitive skills, must come to play an ancillary role.[93]

One set of education policies that Coleman derives from this analysis favors moving the classical, vicarious learning activities out of the school by the "use of what might be termed *skill-specific vouchers* from the federal government. A reading voucher, for example, could be paid to any approved agency teaching reading at a level of skill appropriate for the child."[94] For the nearer future, Coleman suggests that the many educational resources that lie outside the schools "can be brought to bear on basic educational problems by allowing part of the ghetto child's education to take place outside the public schools, drawing upon everything from women's clubs to military industries."[95] As in his proposed future system, "[t]hese resources could be applied by giving educational vouchers directly to the child's family."[96]

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[87] P. 119.
[88] P. 121.
[89] J. COLEMAN, EQUALITY OF EDUCATIONAL OPPORTUNITY (1966).
[90] P. 121–22.
[91] P. 122.
[92] P. 124.
[93] P. 125.

It is not altogether clear, though, what changes in the present system Coleman has in mind when he speaks of vouchers. If his thought is that the marketplace, with vouchers as its currency, will provide the needed diversity and flexibility in educational programs, he gives no evidence that, if called upon, the public education system, as presently financed, could or would not provide the same. And, if he sees vouchers as securing free consumer choice from among the variety of programs available, he gives no reason why an identical range of choice would be impossible in a public system. In short, having left unstated the important distinction between education's *financing*—whether by present methods, by voucher, or by some other means—and its *style and content*—diverse, monolithic, or some mix of the two—Coleman leaves his picture of the necessary future education systems blurry at more than its edges.

This lack of definition is unfortunate since it blocks closer consideration of a particularly important question raised by Coleman's model: how the marketplace would function in terms of providing signals to prospective education consumers, particularly the poor and the illiterate. Because it is information that is being peddled, advertising suffers here defects that are absent elsewhere. Samples of the product will, by definition, be of only limited use to prospective purchasers in this class, and descriptions of what any one program will do for their children will be hardly more instructive.[97]

To all this, Coleman might propose a requirement that voucher programs be accredited and that compliance with minimum standards—possibly measured by kinds of facilities and student performance on uniform tests—be a condition of continued accreditation. He might propose, too, that parents—the prospective purchasers—be apprised of how far above the minimum standards any program is.[98] The trouble with such an accreditation plan, though, is that, to the extent that it is implemented, it merely reintroduces the patterns of uniformity that Coleman apparently wants to escape.

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[94] P. 127.

[95] P. 126.

[96] *Id.*

[97] Also, discussant Patrick Suppes observes: "There is actually considerable historical experience on privately run schools. Before 1850, the bulk of schooling in the Western world probably was private. I am not well versed in these matters, but I know that the abuses to which the private schools were subject are abuses to which mankind as a whole is susceptible, and the voucher idea might well invite such abuses. The schools it produced, for example, might disfavor the poor and disadvantaged, just as many private businesses do now in selling refrigerators and television sets." P. 134.

2. *Work and politics.*

One possible extension from his basic proposal, briefly suggested by Coleman, would modify workplaces to incorporate the young.

> Older children would be partly integrated into work activities, with some time reserved for learning and some for productive work. The separation between economic and educational institutions would vanish; a workplace would also be an educational institution. This reorganization has implications for adults as well. *The conception of full-time education up to a given age, followed by full-time work, would be replaced by a continuing mix beginning* at an early age and running through adulthood.[99]

Systems of this sort, already operative both formally and informally in several areas of work, would project the current concept of work-study into a lifetime pattern.

It seems unlikely that the poor will be in a position to benefit from these programs except to the questionable extent that they will enter the ranks of white collar employment through the educational routes Coleman proposed earlier. The benefits will probably be reaped by professionals and managers, white collar workers generally, and not by workers engaged in production or menial service. It seems manifest that the poor, who characteristically will be without work altogether, or will be engaged in marginal employment, will enjoy scant benefits.[100]

The conduct of the political process will also change. One significant change, a consequence of the widespread introduction of cable systems, will lie in the increased specificity, in terms both of locale and interest, with which constituencies can be delineated and reached. The audience embraced by any television station today contains many constituencies, and for a candidate or advocate of some position to reach the one geographic constituency in which he is interested, he must pay the price for exposure to all the other constituencies that form the station's audience; in most cases, the cost exceeds the potential benefits, and other, possibly less effective, forms of exposure are employed instead. Newspapers and radio can serve somewhat narrower audiences, but the impact of animated, visual presentation is absent. Moreover, constituencies that are defined in terms of interest rather than locale—the nation's physicians, for example, or members of a union—are, in terms of specialized messages, entirely lost to the broadcast media and are serviced instead by national, controlled circulation magazines and other mailings, if at all. Cable's promise here lies in its capacity to serve areas as focused as congressional and aldermanic districts, even neighborhoods, and, through networking, or combined with electronic video recording playback facilities, to serve national interest groups.[101]

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[98] Coleman suggests, for example, that "[a]n important complementary action—which depends upon information-processing capability—is to calculate and publish on a regular basis the average test scores and increments to test scores of public schools as well as those of the reading centers, auxiliary schools, and mathematics centers that would develop. A number of cities under pressure from community groups have begun to publish school-by-school test scores. This information, as it becomes more capable of identifying effective institutions, can become an important aid to children and parents in making their educational selections." P. 126.

[99] P. 128 (emphasis added).

[100] A computer-based system for job-getting, as opposed to job-training, described by John Kemeny in "Large Time-Sharing Networks," pp. 2, 6–8, might have more real and immediate benefits in the area.

Subscriber response systems will introduce another dimension to cable's role in altering the nature of political discourse. The possibilities, both overstated and dangerous, that these systems create for instantaneous polling of viewers for their reactions to events as they occur, should be put to one side. More substantial contributions are conceivable. One cable channel, for example, might be employed to reintroduce into the nation's political life many of the advantages of the town meeting.[102] On a local scale, board of education or town, borough, or city council meetings could be opened to a wider, actively participating audience. Change may be more marked in those situations in which distance presently poses a high barrier to sustained and open political conversation. Thus widely scattered groups possessing common interests may in the future find in cable a convenient medium for ongoing exchange. In short, the limited communications facility presently provided by the telephone, even as expanded by its conference call capacities, may eventually be supplanted by a more facile, immediate video mode. At the same time, information storage and retrieval systems that assemble data respecting individuals' product, service and related preferences, may be used not only by merchants to identify potential customers, but also by advocates to identify their constituencies.

It is entirely speculative whether these changes in the political process will better the situation of the poor. The augmentation by cable of present modes of political communication, though it may yield benefits for some, and even for the polity as a whole, may also have severe dislocating effects.

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[101] *See* I. Pool & H. Alexander, Politics in a Wired Nation, Sept. 1971, at 21–22 (report prepared for the Sloan Commission on Cable Communications). As Paul Baran has thoughtfully observed, the effects of this capacity may not all be beneficial: "A stable national government requires a measure of cohesion of the ruled. Such cohesion can be derived from an implicit mutual agreement on goals and direction—or even on the process of determining goals and direction. With the diversity of information channels available, there is a growing ease of creating groups having access to distinctly differing models of reality, *without overlap*." Baran, *On the Impact of the New Communications Media Upon Social Values*, 34 LAW & CONTEMP. PROB. 244, 249 (1969).

[102] *See* Leonard, Etzioni, Hornstein, Abrams, Stephens & Tichy, *MINERVA: A Participatory Technology System*, 27 BULL. ATOMIC SCIENTISTS, Nov. 1971, at 4.

Precisely because so much will be tied to cable, exclusion from its facilities may for those excluded produce a sharper alienation than presently exists.[103] To the extent that this condition is perceived as intolerable, it may become expedient for government to underwrite the necessary cable installation costs and, in some cases, hardware and connection costs. It should be obvious that access on these terms may, for the poor, also form the basis for access to the cabled education, entertainment, and consumer programs from which they might otherwise be shut out.

Among their other consequences, imminent shifts in the boundaries defining educational, occupational and political institutions will affect the lives of the nation's poor. The most regrettable aspect of the papers collected in this volume is their failure, almost without exception, to explore this set of consequences and to come to grips with the problems of poverty and illiteracy that will lie at the underside of the glossy future they predict. To say that these conditions, though deplorable, fall outside the papers' governing theme—computers, communications, and the public interest—is, I think, not at all responsive. "Public interest," unless it was tacked on for poetic balance, or unless it was construed so narrowly as to exclude this particular public, commands attention to these problems.[104] Perhaps even

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[103] *See* PRESIDENT'S TASK FORCE ON COMMUNICATIONS POLICY, *supra* note 47, at 40–41: "Were the only injury in prospect financial loss to the owners of UHF stations, one could say that such injury is a normal cost of competition and technical progress. But the interests of those stations' viewers need also be taken into account. It is true, of course, that they can subscribe to the cable, but this is subject to the conditions that they have the resources, and that it is available. While advertiser-supported over-the-air television ultimately imposes the costs of broadcast operations upon all users of the advertised products, the cable user is taxed more directly for the service he enjoys, and some may not be able to afford the fee. In addition, a study conducted for us by Complan Associates indicates that under existing technology the cost of wiring the entire country would be prohibitive. In areas remote from population centers, cable television will not be available, pending some technological breakthrough. The inhabitants of such areas will remain dependent upon whatever over-the-air television service is available, and to the extent such service is eliminated by cable competition, these viewers would be adversely affected." *See also* McGowan, Noll & Peck, *supra* note 83, at 213–20.

[104] Also left almost entirely untouched by these discussions were problems of poverty and illiteracy on the global scale. In the time left "for one last topic" at the conclusion of the dinner discussion following Coleman's presentation, Sidney Marland observed, "Within the next ten years international responsibilities will be impinging very heavily on our nation. The illiteracy of the world is increasing by six million people a year. Of the two hundred fifty million school-age children, one hundred fifty million are not in school," and asked, "Can computer-communication technology help us discharge our international responsibilities, albeit we are still not fulfilling our national responsibilities?" Pp. 146–47.

The problem is somewhat larger than Marland's question implies, for it involves not only the discharge of "our international responsibilities" by promoting the diffusion of information across the world, but also the accommodation of critical economic disparities, affecting political outlook, among nations. One important difference between deploying information systems domestically and internationally is that the division within the United States between the haves and the have-nots is not only replicated in the division of populations in other nations but is also represented in a division among nations themselves, specifically between the developed and the developing nations. Recently revealed in the context of attempts to structure an international consensus on the management of environmental quality, this fundamental division also has implications for the international management of information systems. Stockholm, the scene this past June of the United Nations Conference on the Human Environment, was the site, five years earlier, of turbulent and largely inconclusive efforts to accommodate, within the context of the Berne convention, the interests of developing countries—which, possessing few, if any, copyright-based industries and great needs for educational and related materials, perceived their interests to lie in a low level of copyright protection—and the interests of more distressing is that the omission occurred in a context more proximate to policymaking than academics usually come. Many of the participants in this series of discussions, leaders in their respective fields in education, research, and industry, belong to a corps that shuttles easily between the academy and government service. That this concern was omitted from their discussion suggests its omission, too, from the agenda for social planning in the coming years.

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the developed countries—traditionally wedded to a high and continually rising level of protection. For an analysis of the events at Stockholm and after, see Hadl, *Toward International Copyright Revision*, 18 BULL. COPYRIGHT SOC. 183 (1971); *Hearing on Executive G Before the Senate Comm. on Foreign Relations*, 92d Cong., 2d Sess. (1972).

[From the Futurist (Dec. 1982) at 34]

INFORMATION AS A RESOURCE

(By Harlan Cleveland)

The resources of the industrial age were tangible things that could be mined, processed, bought, sold, managed—and easily understood. In the emerging post-industrial society, there is little understanding of the characteristics of information—the basic, yet abstract, resource.

In a remarkably short span of about 10 years, the once prescient notion that industrial society was being transformed into a "post-industrial," "information," or "knowledge" society has become a cliché.

We are already past the jaw-dropping, gee-whiz stage of technological wonder, and have internalized, even if most of us do not really understand, the prospect of trillions of transactions performed in nano-seconds of time. But we have not yet gotten very far in learning how to think about the implications of the information society's technical wizardry for the way we live, work, and play. The hardware can come up with the answer in seconds and communicate it around the world in minutes, but have we asked the right question?

Part of the problem in considering these questions is that we're still struggling with definitions of basic terms, including the very word information. The hierarchy suggested long ago by T.S. Eliot in "The Rock" is a useful starting point: "Where is the wisdom we have lost in knowledge? Where is the knowledge we have lost in information?"

In my lexicon, information is the ore, the sum total of all the facts and ideas that are available to be known by somebody at a given moment in time. Knowledge is the result of somebody applying the refiner's fire to the mass of facts and ideas, selecting and organizing what is useful to somebody. Most knowledge is expertness—in a field, a subject, a process, a way of thinking, a science, a "technology," a system of values, a form of social organization and authority. Wisdom is integrated knowledge information made super-useful by creating theory rooted in disciplined knowledge but crossing disciplinary barriers to weave into an integrated whole something more than the sum of the parts. (The distinction between information and knowledge—or knowledge and wisdom is, of course, subjective. One person's information may be another's knowledge; one person's wisdom may be another's wisecrack.)

It is probably not important to search for universal agreement on the distinctions between knowledge, information, and wisdom. There are many ways to make these distinctions, each of which can help clear intellectually muddied waters in certain contexts. Daniel Bell defines information as "data processing in the broadest sense" and knowledge as "an organized set of statements of facts or ideas . . . communicated to others."

A colleague at the University of Minnesota, Yi-Fu Tuan, organized the T.S. Eliot hierarchy this way:

> . . . The difference is one of order of complexity. Information is horizontal, knowledge is structured and hierarchical, wisdom is organismic and flexible. Any diligent student can, with the help of a computerized system, acquire vast amounts of information; for instance, the population of every township in the United States. But the data are pretty useless because they are stretched out at one level. (Information is horizontal.) For the data to be useful—come to life, as it were—they have to be linked to another rung or category of data. The result is knowledge. (Knowledge is structured and hierarchical.) Every teacher knows how difficult it is to pass knowledge, as distinct from information, to students; hence, we give objective tests to determine how much information, rather than knowledge, they have acquired. As for imparting wisdom, it . . . has to do with personal chemistry and slow osmosis.

THE "INFORMATISATION" OF SOCIETY

While we may not agree on precise definitions, we can probably take as common ground the size and scope of the transition we are in: the "informatisation" of society. (The new word rolls off the tongue more readily in French than in English.) Both the size and scope are impressive, if still largely impressionistic:

A century ago, fewer than 10% of the American labor force were doing information work; now more than 50% of us may be engaged in it. The actual production, extraction, and growing of things now soaks up less than a quarter of our human resources. Of all the rest, which used to be lumped as "services," perhaps two-thirds are information workers.

It is not only in the United States that the informatisation of society has proceeded so far so fast. A recent study by the Organization for Economic Cooperation and Development puts the average information labor force of several of its member countries at one-third of the total during the early- to mid-1970s. That same study indicates that the information component of the labor force increased its share of the total by 2.8 percent during each five-year period since World War II.

While having fewer laborers in production and more in services is not new, what is new is the pace of change made possible by the converging revolutions of computers and telecommunications along with the dawning mass realization that something very large and important is occurring under our very noses. When a much-read philosopher of business administration such as Peter Drucker starts calling knowledge "the central capital, the cost center, and the crucial resource of the economy," non-philosophers preoccupied with the managing of organizations have to sit up and take notice.

My University of Minnesota colleague G. Edward Schuh says, "All of the increase in agricultural output from the mid-1920s through the mid-1970s (a 50-year period!) came about with no increase in the capital stock of physical resources. It was all due to increases in productivity, with most of that due to new knowledge or information. That makes clear the extent to which knowledge is an input or resource."

What is also new is a theory crisis, a sudden sense of having run out of basic assumptions. We have carried over into our thinking about information (which is to say symbols) concepts developed for the management of things—concepts such as property, depletion depreciation, monopoly, market economics, the class struggle, and top-down leadership. But as Simon Nora and Alain Minc say in their report to the president of France: "The liberal and Marxist approaches, contemporaries of the production-based society, are rendered questionable by its demise." The assumptions we have inherited are not producing satisfactory growth with acceptable equity either in the capitalist West or in the socialist East. Maybe it would help if we stop treating information as just another thing, and look hard at what makes it so special.

If information is a resource, it is unique among resources. The resources I learned about in school were tangible: minerals, fuel, food. During my career in the U.S. government, I helped buy and sell resources for the Board of Economic Warfare, transferred resources to other countries through the Marshall Plan and the early foreign-aid programs, argued about "sovereignty over national resources" in U.N. committees, and helped mobilize resources for defense in NATO. In these and other assignments I have brought people ("human resources") together in organizations to manage things and to manage ideas about things. We never said "to manage information."

We have grown up thinking of business as built on resources-as-things. But the physical component of most business now is a small base for an inverted pyramid of organized information. Most people in business now work on ideas, procedures, marketing, advertising, administration, and trying to stay out of trouble with the consumers, the regulators, and the law.

By the same token, the American labor movement was built by and for people who worked with things; its main power base is still in automobiles, steel, freight transportation, metal-working, and other crafts. But thing-oriented work is now the province of a dwindling minority of the U.S. labor force. More and more of the organized workers, and the great bulk of the unorganized, are working in services, and most of the service employees are in information work.

THE CHARACTERISTICS OF INFORMATION

If information (through being refined into knowledge and wisdom) is now our "crucial resource," what does that portend for the future? The inherent characteristics of information now coming into focus give us clues to the vigorous rethinking that must now begin:

1. Information is expandable. Some information for some purposes is certainly depletive over time—yesterday's weather forecast is of merely historical interest tomorrow—but for the most part, as John and Magda McHale were already saying a decade ago, information expands as it is used (see John McHale, "The Changing Information Environment," Westview Press, 1975). Whole industries have grown up to exploit this characteristic of information: scientific research, technology transfer, computer software (which already makes a much bigger contribution to the GNP than the manufacture of computer hardware), and agencies for publishing, advertising, public relations, and governmental propaganda to spread the word (and thus to enhance the word's value).

Because information is expanding without any obvious limits, the facts are never all in—and facts are available in such profusion that uncertainty becomes the most important planning factor. The further a society moves toward making its living from the manipulation of information, the more its citizens will be caught up in a continual struggle to reduce the information overload on their desks and in their lives in order to reduce the uncertainty about what to do. In the information society, we trade glut for scarcity, flood for drought. To find that our "crucial resource" is not scarce does not mean that life will be easier. But it certainly will make life different.

The ultimate "limits to growth" of knowledge and wisdom are time (time available to human minds for reflecting, analyzing, and integrating the information that will be "brought to life" by being used) and the capacity of people—individually and in groups—to analyze and think integratively. There are obviously limits to the time each of us can devote to the production and refinement of knowledge and wisdom. But the capacity of humanity to integrate its collective experience through relevant individual thinking is certainly expandable—not without limits, to be sure, but within limits we cannot now measure or imagine.

2. Information is compressible. Paradoxically, this infinitely expandable resource can be concentrated, integrated, summarized—miniaturized, if you will—for easier handling. We can store many complex cases in a single theorem, squeeze insights from masses of data into a single formula, capture many lessons learned from practical experience in a manual of procedure. By selecting and compressing information to produce knowledge and wisdom, some information is bound to be lost; what is lost may turn out to be trivial or merely interesting, but it could also turn out to be crucially relevant.

3. Information is substitutable. It can replace capital, labor, or physical materials. Robotics and automation in factories and offices are displacing workers and thus requiring a transformation of the labor force. Workers who have previously helped grow or extract or make things, or who have been in the non-information services, will have to learn to become information workers—or get used to being unemployed. This transformation may affect up to 45 million workers by the year 2000, according to Senator Gary Hart in a speech to the World Future Society Assembly on "Communications and the Future."

4. Information is transportable—at the speed of light and perhaps, through telepathy, faster than that. In less than a century, we have been witness to a major dimensional change in both the speed and volume of human activity, a change in transportability of resources greater than the multi-millennial shift from foot travel to supersonic jets.

5. Information is diffusive. It tends to leak—and the more it leaks the more we have. Information is aggressive—even imperialistic—in striving to break out of the unnatural bonds of secrecy in which thing-minded people try to imprison it. Like a virus (which is itself a tiny information system), information tries to affect the organisms around it—whether by over-the-fence gossip or satellite broadcasting. The straitjackets of public secrecy, intellectual property rights, and confidentiality of all kinds fit very loosely on this restless resource.

6. Information is shareable. Shortly before his death, Colin Cherry wrote that information by nature cannot give rise to exchange transactions, only to sharing transactions. Things are exchanged: if I give you a flower or sell you my automobile, you have it and I don't. But if I sell you an idea, we both have it. And if I give you a fact or tell you a story, it's like a good kiss: in sharing the thrill, you enhance it.

A NEW KIND OF RESOURCE

The information resource, in short, is different in kind from other resources. So it has to be a mistake to carry over uncritically to the management of information those concepts that have proven so useful during the centuries when things were the dominant resources and the prime objects of commerce, politics, and prestige. These concepts include scarcity, bulk, limited substitutability, trouble in transporting them, and the notion of hiding and hoarding a resource.

A society in which information is the dominant resource is not necessarily "better" or "worse," fairer or more exploitative, cleaner or dirtier, or happier or unhappier than agricultural or industrial societies in which physical, tangible resources are dominant. The quality, relevance, and usefulness of information are not givens. They depend on who uses the information, in how refined a form, and for what purposes.

IMPLICATIONS FOR HUMAN LIFE

The implications of treating information as a resource are enormous, for lifestyles and workways, for human community and inhuman conflict.

The implications, I believe, are especially great for changes in the way we think about life, work, community, and conflict. The theories (assumptions, preconceptions, ideologies, call them what you will) we develop will arrange "the facts" and determine how we resolve, for our time and place, the historic social dilemmas—freedom vs. organization, autonomy vs. authority, participation vs. action, growth vs. equity, war vs. peace.

If our dominant resource is now expandable, compressible, substitutable, highly transportable, diffusive, and shareable, what are the implications for some of our favorite and predominant theories and assumptions?

In political economy, won't the concept of market "exchange" have to take account of the fact that more and more of our economic activity now consists of what are by nature "sharing" transactions?

In economics, why are we still focusing on the allocation of scarcities when there is a chronic surplus of information resources?

In law, how should we adapt the concept of property in facts and ideas when the widespread violation of copyrights and the shortened life of patent rights have become the unenforceable Prohibition of our time? Aren't we going to have to invent different ways to reward intellectual labor that are compatible with a resource that is both diffusive and shareable? Aren't the laws governing privacy and the regulations governing telecommunications already outmoded by technology, which does not wait around for legislative hearings or court calendars?

In accounting, what are we to do with a concept called "depreciation" in a society where a large fraction of its resources does not depreciate with use?

In education, doesn't the information environment place a much greater premium on integrative thought? Won't we have to take a new look at a system that awards the highest credentials for wisdom to people with the narrowest slices of knowledge? And as the education required to be functionally literate in an information society keeps growing in depth and breadth, what is to become of those who, because they lack basic education or the opportunity for continued learning, become the peasants of the knowledge society?

In the new information environment, we will have to rethink the very nature of rule, power, and authority because the information revolution is producing a revolution in the technology of organization.

Information has always been the basis of human organization, of course. People with better or more recent information—generals with fast couriers, kings with spies and ambassadors, etc.—held sway over the rest of mankind. But once information could be rapidly collected and analyzed, instantly communicated, and readily understood by millions, the power monopolies that closely held information made possible were subject to accelerating erosion.

Leadership of uninformed people was likely to be organized in vertical structures of command and control. Leadership of the informed is more likely to result in effective action if it is exercised mainly by persuasion, with wider participation and more collective thought.

With nobody completely in charge but everybody partly in charge, collegial rather than command structures are the more natural basis for organization. "Planning" cannot be done by a few leaders, advised in secret by experts with detailed blueprints; "planning" has to be a dynamic improvisation by the many according to a general sense of direction that is announced by "leaders" only after genuine consultation with those who will have to improvise on it.

Participatory decision-making implies a need for much feedback information, widely available and seriously attended. That means more openness and less secrecy—not as an ideological preference but as a technological imperative. In the Information Society, maybe that's the updated definition of democracy.

APPENDIX IV
JUDICIAL DECISIONS AND LEGISLATIVE MATERIALS

APPLE COMPUTER, INC., a California corporation, Appellant,

v.

FRANKLIN COMPUTER CORPORATION, a Pennsylvania corporation.

No. 82-1582.

United States Court of Appeals, Third Circuit.

Argued March 17, 1983.

Decided Aug. 30, 1983.

Rehearing and Rehearing In Banc Denied Sept. 23, 1983.

Certiorari Dismissed Jan. 4, 1984. See 104 S.Ct. 690.

Copyright holder appealed from an order of the United States District Court for the Eastern District of Pennsylvania, Clarence C. Newcomer, J., 545 F.Supp. 812, denying its motion to preliminary enjoin competitor from infringing copyrights on computer programs. The Court of Appeals, Sloviter, Circuit Judge, held that: (1) computer program, whether in object code or source code, is "literary work" and is protected from unauthorized copying, whether from its object or source code version; (2) computer program on object code embedded in ROM chip is appropriate subject of copyright; (3) computer operating system programs are not per se precluded from copyright; and (4) even without presumption of irreparable harm generally applied in copyright infringement actions, jeopardy to copyright holder's investment and competitive position caused by competitor's wholesale copying of many of copyright holder's key operating programs would satisfy requirement of irreparable harm needed to support preliminary injunction.

Reversed and remanded.

1. Injunction 🔑135

Decision to grant or refuse preliminary injunction is within discretion of district court.

2. Federal Courts 🔑815

Although scope of Court of Appeals' review of action of district court in ruling on motion for preliminary injunction is narrow, reversal is warranted if trial court has abused its discretion or committed error in applying the law.

3. Copyrights and Intellectual Property 🔑10.4

Computer programs are copyrightable and are otherwise afforded copyright protection. 17 U.S.C.A. §§ 101 et seq., 102(a), 117.

4. Copyrights and Intellectual Property 🔑5

Computer program, whether in object code or source code, is "literary work" with-

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4. Because of our disposition of this case, it is not necessary to reach appellant's further contentions that she was deprived of a full and fair hearing before the Administrative Law Judge and that even under the standard advocated by the Secretary the finding of no disability is not supported by substantial evidence.

in meaning of Copyright Act of 1976 and is protected from unauthorized copying, whether from its object or source code version. 17 U.S.C.A. §§ 101, 102(a).

5. Copyrights and Intellectual Property ⇐10.4

Computer program in object code embedded in ROM chip is appropriate subject of copyright. 17 U.S.C.A. §§ 101, 102(a).

6. Evidence ⇐265(15)

Statements of nonlawyer witnesses, without experience in using statutory language as words of art, in describing computer operating system programs at preliminary injunction hearing as processes or methods of operation were not binding admissions against copyright holder in determining copyrightability of programs. 17 U.S.C.A. §§ 101, 102(a).

7. Copyrights and Intellectual Property ⇐10.4

Method which instructed computer to perform its operating functions would be protected, if at all, by patent law and was not subject to copyright law protection. 17 U.S.C.A. §§ 101, 102(b).

8. Copyrights and Intellectual Property ⇐10.4

Computer operating system program was not "process," "system," or "method of operation" and hence per se precluded from copyright, even though program instructed computer to perform its operating functions, and notwithstanding fact that operating system program was etched on ROM chip, where copyright was not sought of method which instructed computer to perform its operating functions but only of instructions themselves, operating system did not have to be permanently in machine in ROM but could be on some other medium, and statutory definition of computer program as set of instructions to be used in computer in order to bring about certain result made no distinction between application programs and operating systems. 17 U.S.C.A. §§ 101, 102(b).

9. Copyrights and Intellectual Property ⇐10.4

If other programs could be written or created which performed same function as copyright holder's operating system program, program was "expression" of idea and hence copyrightable. 17 U.S.C.A. § 102(b).

See publication Words and Phrases for other judicial constructions and definitions.

10. Copyrights and Intellectual Property ⇐10.4

Computer operating system programs are not per se precluded from copyright. 17 U.S.C.A. §§ 101, 102(b).

11. Copyrights and Intellectual Property ⇐85

Copyright plaintiff who makes out prima facie case of infringement is entitled to preliminary injunction without detailed showing of irreparable harm. 17 U.S.C.A. §§ 101 et seq., 102(a).

12. Copyrights and Intellectual Property ⇐85

Even without presumption of irreparable harm generally applied in copyright infringement actions, jeopardy to copyright holder's investment and competitive position caused by competitor's wholesale copying of many of copyright holder's key computer operating programs would satisfy requirement of irreparable harm needed to support preliminary injunction. ,17 U.S.C.A. §§ 101 et seq., 102(a).

13. Copyrights and Intellectual Property ⇐85

Inverse relationship approach to irreparable harm issue, under which strength of required showing of irreparable injury varies inversely with strength of plaintiff's showing of likelihood of success on merits, is best suited to those copyright infringement actions in which injury from copying can be fairly considered minimal, limited or conjectural; normally, public interest underlying copyright law requires presumption of irreparable harm as long as there is adequate evidence of expenditure of significant time, effort and money directed to production of copyrighted material. 17 U.S.C.A. §§ 101 et seq., 102(a).

14. Copyrights and Intellectual Property 🔑85

Size of infringer should not be determinative of copyright holder's ability to get prompt judicial redress for alleged infringement. 17 U.S.C.A. §§ 101 et seq., 102(a).

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Before HUNTER, HIGGINBOTHAM and SLOVITER, Circuit Judges.

OPINION OF THE COURT

SLOVITER, Circuit Judge.

I.

INTRODUCTION

Apple Computer, Inc. appeals from the district court's denial of a motion to preliminarily enjoin Franklin Computer Corp. from infringing the copyrights Apple holds on fourteen computer programs.

[1, 2] The decision to grant or refuse to grant a preliminary injunction is within the discretion of the district court. *See A.O. Smith Corp. v. FTC*, 530 F.2d 515, 525 (3d Cir.1976). Although the scope of our review of the action of the district court in ruling on a motion for preliminary injunction is narrow, reversal is warranted if the trial court has abused its discretion or committed error in applying the law. *Kennecott Corp. v. Smith*, 637 F.2d 181, 187 (3d Cir.1980). As the Second Circuit has stated recently, "Despite oft repeated statements that the issuance of a preliminary injunction rests in the discretion of the trial judge whose decisions will be reversed only for 'abuse', a court of appeals must reverse if the district court has proceeded on the basis of an erroneous view of the applicable law." *Donovan v. Bierwirth*, 680 F.2d 263, 269 (2d Cir.), *cert. denied*, — U.S. —, 103 S.Ct. 488, 74 L.Ed.2d 631 (1982).

In this case the district court denied the preliminary injunction, *inter alia*, because it had "some doubt as to the copyrightability of the programs." *Apple Computer, Inc. v. Franklin Computer Corp.*, 545 F.Supp. 812, 812 (E.D.Pa.1982). This legal ruling is fundamental to all future proceedings in this action and, as the parties and amici curiae seem to agree, has considerable significance to the computer services industry.[1] Because we conclude that the district court proceeded under an erroneous view of the applicable law, we reverse the denial of the preliminary injunction and remand.

II.

FACTS AND PROCEDURAL HISTORY

Apple, one of the computer industry leaders, manufactures and markets personal computers (microcomputers), related peripheral equipment such as disk drives (peripherals), and computer programs (software). It presently manufactures Apple II computers and distributes over 150 programs. Apple has sold over 400,000 Apple II computers, employs approximately 3,000 people, and had annual sales of $335,000,000 for fiscal year 1981. One of the byproducts of Apple's success is the independent development by third parties of numerous computer programs which are designed to run on the Apple II computer.

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[1] Four amicus curiae briefs have been submitted; briefs from Digital Research Inc., Microsoft Corp., and Association of Data Processing Service Organizations, Inc. (a trade association for the computer services industry), support the position of Apple, and a brief from Pro-log Corp. supports at least part of Franklin's position.

Franklin, the defendant below, manufactures and sells the ACE 100 personal computer and at the time of the hearing employed about 75 people and had sold fewer than 1,000 computers. The ACE 100 was designed to be "Apple compatible," so that peripheral equipment and software developed for use with the Apple II computer could be used in conjunction with the ACE 100. Franklin's copying of Apple's operating system computer programs in an effort to achieve such compatibility precipitated this suit.

Like all computers both the Apple II and ACE 100 have a central processing unit (CPU) which is the integrated circuit that executes programs. In lay terms, the CPU does the work it is instructed to do. Those instructions are contained on computer programs.

There are three levels of computer language in which computer programs may be written.[2] High level language, such as the commonly used BASIC or FORTRAN, uses English words and symbols, and is relatively easy to learn and understand (e.g., "GO TO 40" tells the computer to skip intervening steps and go to the step at line 40). A somewhat lower level language is assembly language, which consists of alphanumeric labels (e.g., "ADC" means "add with carry"). Statements in high level language, and apparently also statements in assembly language, are referred to as written in "source code." The third, or lowest level computer language, is machine language, a binary language using two symbols, 0 and 1, to indicate an open or closed switch (e.g., "01101001" means, to the Apple, add two numbers and save the result). Statements in machine language are referred to as written in "object code."

The CPU can only follow instructions written in object code. However, programs are usually written in source code which is more intelligible to humans. Programs written in source code can be converted or translated by a "compiler" program into object code for use by the computer. Programs are generally distributed only in their object code version stored on a memory device.

A computer program can be stored or fixed on a variety of memory devices, two of which are of particular relevance for this case. The ROM (Read Only Memory) is an internal permanent memory device consisting of a semi-conductor "chip" which is incorporated into the circuitry of the computer. A program in object code is embedded on a ROM before it is incorporated in the computer. Information stored on a ROM can only be read, not erased or rewritten.[3] The ACE 100 apparently contains EPROMS (Erasable Programmable Read Only Memory) on which the stored information can be erased and the chip reprogrammed, but the district court found that for purposes of this proceeding, the difference between ROMs and EPROMs is inconsequential. 545 F.Supp. at 813 n. 3. The other device used for storing the programs at issue is a diskette or "floppy disk", an auxiliary memory device consisting of a flexible magnetic disk resembling a phonograph record, which can be inserted into the computer and from which data or instructions can be read.

Computer programs can be categorized by function as either application programs or operating system programs. Application programs usually perform a specific task for the computer user, such as word processing, checkbook balancing, or playing a game. In contrast, operating system programs generally manage the internal functions of the computer or facilitate use of application programs. The parties agree that the fourteen computer programs at issue in this suit are operating system programs.[4]

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[2] Useful nontechnical descriptions of computer operations appear in Note, *Copyright Protection for Computer Programs In Read Only Memory Chips*, 11 Hofstra L.Rev. 329 (1982), and Note, *Copyright Protection of Computer Program Object Code*, 96 Harv.L.Rev. 1723 (1983).

[3] In contrast to the permanent memory devices a RAM (Random Access Memory) is a chip on which volatile internal memory is stored which is erased when the computer's power is turned off.

Apple filed suit in the United States District Court for the Eastern District of Pennsylvania pursuant to 28 U.S.C. § 1338 on May 12, 1982, alleging that Franklin was liable for copyright infringement of the fourteen computer programs, patent infringement, unfair competition, and misappropriation. Franklin's answer in respect to the copyright counts included the affirmative defense that the programs contained no copyrightable subject matter. Franklin counterclaimed for declaratory judgment that the copyright registrations were invalid and unenforceable, and sought affirmative relief on the basis of Apple's alleged misuse. Franklin also moved to dismiss eleven of the fourteen copyright infringement counts on the ground that Apple failed to comply with the procedural requirements for suit under 17 U.S.C. §§ 410, 411.

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[4] The fourteen programs at issue, briefly described, are:

(1) *Autostart ROM* is sold as part of the Apple Computer and is embedded on a ROM chip. The program has also been published in source code as part of a copyrighted book, the Apple II manual. When the computer's power is turned on, Autostart ROM performs internal routines that turn on the circuits in the computer and make its physical parts (e.g. input/output devices, screen, and memory) ready for use.

(2) *Applesoft* is Apple's version of the Beginner's All-purpose Symbolic Instruction Code (BASIC) language. The program is stored in ROM and is sold as part of the computer. Applesoft translates instructions written in the higher-level BASIC language into the lower-level machine code that the computer understands.

(3) *Floating-Point BASIC* is the same program as Applesoft but is stored on disks rather than on ROMs. It is used in earlier versions of the Apple II computer that did not have the Applesoft program in ROM.

(4) *Apple Integer BASIC*, another translator program, is stored on the DOS 3.3 Master Disk. This program used Apple's first version of BASIC for the Apple II computer. It implements a simpler version of the Applesoft program.

(5) *DOS 3.3*, the disk operating system program, provides the instructions necessary to control the operation between the disk system (disk drive) and the computer itself. It controls the reading and writing functions of the disks and includes other routines which put all the data transfers in sequence. The DOS 3.3 Master Disk is sold separately from the computer, and includes several of the other operating programs referred to in this note.

(6) *Master Create* is stored on a disk. When a disk is prepared for use the DOS 3.3 program is placed on that disk in a form that is dependent on the amount of Random Access Memory (RAM) available. The Master Create program replaces the DOS 3.3 on the disk with a version that is independent of the amount of RAM available.

(7) *Copy*, which is stored on a disk, enables the user to copy programs written in Apple Integer BASIC from one disk to another.

(8) *Copy A*, also stored on a disk, enables the user to copy programs written in Applesoft from one disk to another.

(9) *Copy OBJO* contains a file of subroutines used by the Copy and Copy A programs.

(10) *Chain*, another disk stored program, allows data to be passed between different parts of a program when only one part of the program is in RAM at a given time. Thus, Chain preserves data already stored in RAM while another part of the program is being loaded into RAM.

(11) *Hello*, also disk stored, is the first program executed after the power is turned on and a disk is ready for use. It determines how much RAM is in the computer and which version of BASIC needs to be loaded into the computer.

(12) *Boot 13* is stored on disk and sold on a Master Disk. It allows the user having a disk controller card that contains the Apple 16-Sector Boot ROM to use older versions of the Apple disk operating system.

(13) *Apple 13-Sector Boot ROM* is stored in a ROM located on the disk controller card plugged into the Mother Board. By turning on numerous circuits on the card and in the Apple II computer, this program causes other parts of the disk operating system used for 13-Sector format disks to load.

(14) *Apple 16-Sector Boot ROM*, stored in a ROM located on the disk controller card, turns on numerous circuits on the card and in the Apple II computer and causes other parts of the disk operating system used for 16-Sector format disks to load. It therefore enables the user to start or permit the running of another program or to prepare the computer to receive a program.

The above descriptions represent an effort to translate the language used by computer experts into language reasonably intelligible to lay persons. They differ in some respects from the descriptions in the district court's opinion, 545 F.Supp. at 815–16, which were taken from the complaint.

After expedited discovery, Apple moved for a preliminary injunction to restrain Franklin from using, copying, selling, or infringing Apple's copyrights. The district court held a three day evidentiary hearing limited to the copyright infringement claims. Apple produced evidence at the hearing in the form of affidavits and testimony that programs sold by Franklin in conjunction with its ACE 100 computer were virtually identical with those covered by the fourteen Apple copyrights. The variations that did exist were minor, consisting merely of such things as deletion of reference to Apple or its copyright notice.[5] James Huston, an Apple systems programmer, concluded that the Franklin programs were "unquestionably copied from Apple and could not have been independently created." He reached this conclusion not only because it is "almost impossible for so many lines of code" to be identically written, but also because his name, which he had embedded in one program (Master Create), and the word "Applesoft", which was embedded in another (DOS 3.3), appeared on the Franklin master disk. Apple estimated the "works in suit" took 46 man-months to produce at a cost of over $740,000, not including the time or cost of creating or acquiring earlier versions of the programs or the expense of marketing the programs.

Franklin did not dispute that it copied the Apple programs. Its witness admitted copying each of the works in suit from the Apple programs. Its factual defense was directed to its contention that it was not feasible for Franklin to write its own operating system programs. David McWherter, now Franklin's vice-president of engineering, testified he spent 30–40 hours in November 1981 making a study to determine if it was feasible for Franklin to write its own Autostart ROM program and concluded it was not because "there were just too many entry points in relationship to the number of instructions in the program." Entry points at specific locations in the program can be used by programmers to mesh their application programs with the operating system program. McWherter concluded that use of the identical signals was necessary in order to ensure 100% compatibility with application programs created to run on the Apple computer. He admitted that he never attempted to rewrite Autostart ROM and conceded that some of the works in suit (*i.e.* Copy, Copy A, Master Create, and Hello) probably could have been rewritten by Franklin. Franklin made no attempt to rewrite any of the programs prior to the lawsuit except for Copy, although McWherter testified that Franklin was "in the process of redesigning" some of the Apple programs and that "[w]e had a fair degree of certainty that that would probably work." Apple introduced evidence that Franklin could have rewritten programs, including the Autostart ROM program, and that there are in existence operating programs written by third parties which are compatible with Apple II.

Franklin's principal defense at the preliminary injunction hearing and before us is primarily a legal one, directed to its contention that the Apple operating system programs are not capable of copyright protection.

The district court denied the motion for preliminary injunction by order and opinion dated July 30, 1982. Apple moved for reconsideration in light of this court's decision in *Williams Electronics, Inc. v. Artic International, Inc.*, 685 F.2d 870 (3d Cir.1982), which was decided August 2, 1982, three days after the district court decision. The district court denied the motion for reconsideration. We have jurisdiction of Apple's appeal pursuant to 28 U.S.C. § 1292(a)(1).

III.

THE DISTRICT COURT OPINION

In its opinion, the district court referred to the four factors to be considered on request for a preliminary injunction: a reasonable probability of success on the merits; irreparable injury; the improbability of harm to other interested persons; and the public interest. 545 F.Supp. at 825; *see Delaware River Port Authority v. Transamerican Trailer Transport, Inc.*, 501 F.2d 917, 919–20 (3d Cir.1974). The court stated it based its denial of the motion on the first two factors. The court held Apple had not made the requisite showing of likelihood of success on the merits because it "concluded that there is some doubt as to the copyrightability of the programs described in this litigation." 545 F.Supp. at 812. It also stated that "Apple is better suited to withstand whatever injury it might sustain during litigation than is Franklin to withstand the effects of a preliminary injunction" because an injunction would have a "devastating effect" on Franklin's business, *id.* at 825, apparently concluding on that basis that Apple had failed to show irreparable harm.

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[5] For example, 8 bytes of memory were altered in the Autostart ROM program so that when the computer is turned on "ACE 100" appears on the screen rather than "Apple II." The Franklin DOS 3.3 program also had 16 bytes (out of 9000) that allowed use of upper and lower case.

It is difficult to discern precisely why the district court questioned the copyrightability of the programs at issue since there is no finding, statement, or holding on which we can focus which clearly sets forth the district court's view. Throughout the opinion the district court referred to the "complexity of the question presented by the present case", 545 F.Supp. at 824, and the "baffling" problem at issue. *Id.* at 822.

The opinion expresses a series of generalized concerns which may have led the court to its ultimate conclusion, and which the parties and amici treat as holdings. The district court referred to the requirement under the Copyright Act of finding "original works of authorship", 17 U.S.C. § 102(a), and seems to have found that there was a sufficient "modicum of creativity" to satisfy the statutory requirement of an "original work". 545 F.Supp. at 820–21. The court was less clear as to whether the creation of a computer program by a programmer satisfied the requirement of "works of authorship", *id.*, and whether an operating system program in "binary code or one represented either in a ROM or by micro-switches" was an "expression" which could be copyrighted as distinguished from an "idea" which could not be. *Id.* at 821.

Again, although we cannot point to a specific holding, running throughout the district court opinion is the suggestion that programs in object code and ROMs may not be copyrightable. Thus, for example, in a series of discursive footnotes, the district court stated that it found "persuasive" a district court opinion "holding that object code in ROM is not copyright protected", 545 F.Supp. at 818 n. 8 (referring to *Data Cash Systems, Inc. v. JS & A Group, Inc.*, 480 F.Supp. 1063 (N.D.Ill.1979), *aff'd on other grounds*, 628 F.2d 1038 (7th Cir.1980)); described an opinion reaching a contrary conclusion as containing "rather terse analysis [which] provides little guidance", 545 F.Supp. at 818 n. 8 (referring to *GCA Corp. v. Chance*, 217 U.S.P.Q. 718 (N.D.Cal.1982), which followed the reasoning of *Tandy Corp. v. Personal Micro Computers, Inc.*, 524 F.Supp. 171 (N.D.Cal.1981)), and stated that "Congressional intent regarding the copyrightability of object codes and ROMs is not clear", 545 F.Supp. at 819, n. 9, and that even among members of the industry it was not clear that the copyright law protects works "like those in suit that are ROM-based," *id.* at 819 n. 10.

We read the district court opinion as presenting the following legal issues: (1) whether copyright can exist in a computer program expressed in object code, (2) whether copyright can exist in a computer program embedded on a ROM, (3) whether copyright can exist in an operating system program, and (4) whether independent irreparable harm must be shown for a preliminary injunction in copyright infringement actions.

IV.

DISCUSSION

A.

Copyrightability of a Computer Program Expressed in Object Code

Certain statements by the district court suggest that programs expressed in object code, as distinguished from source code, may not be the proper subject of copyright. We find no basis in the statute for any such concern. Furthermore, our decision in *Williams Electronics, Inc. v. Artic International, Inc., supra,* laid to rest many of the doubts expressed by the district court.

In 1976, after considerable study, Congress enacted a new copyright law to replace that which had governed since 1909. Act of October 19, 1976, Pub.L. No. 94-553, 90 Stat. 2541 (*codified* at 17 U.S.C. §§ 101 *et seq.*). Under the law, two primary requirements must be satisfied in order for a work to constitute copyrightable subject matter—it must be an "original wor[k] of authorship" and must be "fixed in [a] tangible medium of expression." 17 U.S.C. § 102(a). The statute provides:

> (a) Copyright protection subsists, in accordance with this title, in original works of authorship fixed in any tangible medium of expression, now known or later developed, from which they can be perceived, reproduced, or otherwise communicated, either directly or with the aid of a machine or device.

Id. The statute enumerates seven categories under "works of authorship" including "literary works", defined as follows:

> "Literary works" are works, other than audiovisual works, expressed in words, numbers, or other verbal or numerical symbols or indicia, regardless of the nature of the material objects, such as books, periodicals, manuscripts, phonorecords, film, tapes, disks, or cards, in which they are embodied.

17 U.S.C. § 101. A work is "fixed" in a tangible medium of expression when:

> its embodiment in a copy or phonorecord, by or under the authority of the author, is sufficiently permanent or stable to permit it to be perceived, reproduced, or otherwise communicated for a period of more than transitory duration. A work consisting of sounds, images, or both, that are being transmitted, is "fixed" for purposes of this title if a fixation of the work is being made simultaneously with its transmission.

Id.

Although section 102(a) does not expressly list computer programs as works of authorship, the legislative history suggests that programs were considered copyrightable as literary works. *See* H.R.Rep. No. 1476, 94th Cong., 2d Sess. 54, *reprinted in* 1976 U.S.Code Cong. & Ad.News 5659, 5667 (" 'literary works' . . . includes . . . computer programs"). Because a Commission on New Technological Uses ("CONTU") had been created by Congress to study, *inter alia,* computer uses of copyrighted works, Pub.L. No. 93-573, § 201, 88 Stat. 1873 (1974), Congress enacted a status quo provision, section 117, in the 1976 Act concerning such computer uses pending the CONTU report and recommendations.[6]

The CONTU Final Report recommended that the copyright law be amended, *inter alia,* "to make it explicit that computer programs, to the extent that they embody an author's original creation, are proper subject matter of copyright." National Commission on New Technological Uses of Copyrighted Works, *Final Report* 1 (1979) [hereinafter CONTU Report]. CONTU recommended two changes relevant here: that section 117, the status quo provision, be repealed and replaced with a section limiting exclusive rights in computer programs so as "to ensure that rightful possessors of copies of computer programs may use or adapt these copies for their use," *id.;* and that a definition of computer program be added to section 101. *Id.* at 12. Congress adopted both changes. Act of Dec. 12, 1980, Pub.L. No. 96-517, § 10, 94 Stat. 3015, 3028. The revisions embodied CONTU's recommendations to clarify the law of copyright of computer software. H.R.Rep. No. 1307, 96th Cong., 2d Sess. 23, *reprinted in* 1980 U.S.Code Cong. & Ad.News 6460, 6482.

[3] The 1980 amendments added a definition of a computer program:

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[6] Section 117 applied only to the scope of protection to be accorded copyrighted works when used in conjunction with a computer and not to the copyrightability of programs. H.R.Rep. No. 1476, at 116, *reprinted in* 1976 U.S.Code Cong. & Ad.News at 5731.

> A "computer program" is a set of statements or instructions to be used directly or indirectly in a computer in order to bring about a certain result.

17 U.S.C. § 101. The amendments also substituted a new section 117 which provides that "it is not an infringement for the owner of a copy of a computer program to make or authorize the making of another copy or adaptation of that computer program" when necessary to "the utilization of the computer program" or "for archival purposes only." 17 U.S.C. § 117. The parties agree that this section is not implicated in the instant lawsuit. The language of the provision, however, by carving out an exception to the normal proscriptions against copying, clearly indicates that programs are copyrightable and are otherwise afforded copyright protection.

We considered the issue of copyright protection for a computer program in *Williams Electronics, Inc. v. Artic International, Inc.*, and concluded that "the copyrightability of computer programs is firmly established after the 1980 amendment to the Copyright Act." 685 F.2d at 875. At issue in *Williams* were not only two audiovisual copyrights to the "attract" and "play" modes of a video game, but also the computer program which was expressed in object code embodied in ROM and which controlled the sights and sounds of the game. Defendant there had argued "that when the issue is the copyright on a computer program, a distinction must be drawn between the 'source code' version of a computer program, which ... can be afforded copyright protection, and the 'object code' stage, which ... cannot be so protected," an argument we rejected. *Id.* at 876.

The district court here questioned whether copyright was to be limited to works "designed to be 'read' by a human reader [as distinguished from] read by an expert with a microscope and patience", 545 F.Supp. at 821. The suggestion that copyrightability depends on a communicative function to individuals stems from the early decision of *White-Smith Music Publishing Co. v. Apollo Co.*, 209 U.S. 1, 28 S.Ct. 319, 52 L.Ed. 655 (1908), which held a piano roll was not a copy of the musical composition because it was not in a form others, except perhaps for a very expert few, could perceive. *See* 1 *Nimmer on Copyright* § 2.03[B][1] (1983). However, it is clear from the language of the 1976 Act and its legislative history that it was intended to obliterate distinctions engendered by *White-Smith*. H.R.Rep. No. 1476, *supra*, at 52, *reprinted in* 1976 U.S.Code Cong. & Ad. News at 5665.

Under the statute, copyright extends to works in any tangible means of expression "*from which they can be perceived*, reproduced, or otherwise communicated, either directly or *with the aid of a machine or device*." 17 U.S.C. § 102(a) (emphasis added). Further, the definition of "computer program" adopted by Congress in the 1980 amendments is "sets of statements or instructions to be used *directly or indirectly* in a computer in order to bring about a certain result." 17 U.S.C. § 101 (emphasis added). As source code instructions must be translated into object code before the computer can act upon them, only instructions expressed in object code can be used "directly" by the computer. *See Midway Manufacturing Co. v. Strohon*, 564 F.Supp. 741 at 750–751 (N.D.Ill.1983). This definition was adopted following the CONTU Report in which the majority clearly took the position that object codes are proper subjects of copyright. *See* CONTU Report at 21. The majority's conclusion was reached although confronted by a dissent based upon the theory that the "machine-control phase" of a program is not directed at a human audience. *See* CONTU Report at 28–30 (dissent of Commissioner Hersey).

The defendant in *Williams* had also argued that a copyrightable work "must be intelligible to human beings and must be intended as a medium of communication to human beings," *id.* at 876–77. We reiterate the statement we made in *Williams* when we rejected that argument: "[t]he answer to defendant's contention is in the words of the statute itself." 685 F.2d at 877.

[4] The district court also expressed uncertainty as to whether a computer program in object code could be classified as a "literary work."[7] However, the category of "literary works", one of the seven copyrightable categories, is not confined to literature in the nature of Hemingway's *For Whom the Bell Tolls*. The definition of "literary works" in section 101 includes expression not only in words but also "numbers, or other ... numerical symbols or indicia", thereby expanding the common usage of "literary works." *Cf. Harcourt, Brace & World, Inc. v. Graphic Controls Corp.*, 329 F.Supp. 517, 523–24 (S.D.N.Y. 1971) (the symbols designating questions or response spaces on exam answer sheets held to be copyrightable "writings" under 1909 Act); *Reiss v. National Quotation Bureau, Inc.*, 276 F. 717 (S.D.N.Y.1921) (code book of coined words designed for cable use copyrightable). Thus a computer program, whether in object code or source code, is a "literary work" and is protected from unauthorized copying, whether from its object or source code version. *Accord Midway Mfg. Co. v. Strohon*, 564 F.Supp. at 750–751; *see also GCA Corp. v. Chance*, 217 U.S.P.Q. at 719–20.

B.

Copyrightability of a Computer Program Embedded on a ROM

[5] Just as the district court's suggestion of a distinction between source code and object code was rejected by our opinion in *Williams* issued three days after the district court opinion, so also was its suggestion that embodiment of a computer program on a ROM, as distinguished from in a traditional writing, detracts from its copyrightability. In *Williams* we rejected the argument that "a computer program is not infringed when the program is loaded into electronic memory devices (ROMs) and used to control the activity of machines." 685 F.2d at 876. Defendant there had argued that there can be no copyright protection for the ROMs because they are utilitarian objects or machine parts. We held that the statutory requirement of "fixation", the manner in which the issue arises, is satisfied through the embodiment of the expression in the ROM devices. *Id.* at 874, 876; *see also Midway Mfg. Co. v. Strohon*, 564 F.Supp. at 751–752; *Tandy Corp. v. Personal Micro Computers, Inc.*, 524 F.Supp. at 173; *cf. Stern Electronics, Inc. v. Kaufman*, 669 F.2d 852, 855–56 (2d Cir.1982) (audiovisual display of video game "fixed" in ROM). Therefore we reaffirm that a computer program in object code embedded in a ROM chip is an appropriate subject of copyright. *See also Note, Copyright Protection of Computer Program Object Code*, 96 Harv.L. Rev. 1723 (1983); *Note, Copyright Protection for Computer Programs in Read Only Memory Chips*, 11 Hofstra L.Rev. 329 (1982).

C.

Copyrightability of Computer Operating System Programs

We turn to the heart of Franklin's position on appeal which is that computer operating system programs, as distinguished from application programs, are not the proper subject of copyright "regardless of the language or medium in which they are fixed." Brief of Appellee at 15 (emphasis deleted). Apple suggests that this issue too is foreclosed by our *Williams* decision because some portion of the program at issue there was in effect an operating system program. Franklin is correct that this was not an issue raised by the parties in *Williams* and it was not considered by the court. Thus we consider it as a matter of first impression.

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[7] The district court stated that a programmer working directly in object code appears to think more as a mathematician or engineer, that the process of constructing a chip is less a work of authorship than the product of engineering knowledge, and that it may be more apt to describe an encoded ROM as a pictorial three-dimensional object than as a literary work. 545 F.Supp. at 821–22. The district court's remarks relied in part on a quotation about "microcode", *see id.* at 821 n. 14; Apple introduced testimony that none of the works in suit contain "microcode." Moreover, Apple does not seek to protect the ROM's architecture but only the program encoded upon it.

Franklin contends that operating system programs are *per se* excluded from copyright protection under the express terms of section 102(b) of the Copyright Act, and under the precedent and underlying principles of *Baker v. Selden*, 101 U.S. 99, 25 L.Ed. 841 (1879). These separate grounds have substantial analytic overlap.

In *Baker v. Selden*, plaintiff's testator held a copyright on a book explaining a bookkeeping system which included blank forms with ruled lines and headings designed for use with that system. Plaintiff sued for copyright infringement on the basis of defendant's publication of a book containing a different arrangement of the columns and different headings, but which used a similar plan so far as results were concerned. The Court, in reversing the decree for the plaintiff, concluded that blank account-books were not the subject of copyright and that "the mere copyright of Selden's book did not confer upon him the exclusive right to make and use account-books, ruled and arranged as designated by him and described and illustrated in said book." *Id.* at 107. The Court stated that copyright of the books did not give the plaintiff the exclusive right to use the system explained in the books, noting, for example, that "copyright of a work on mathematical science cannot give to the author an exclusive right to the methods of operation which he propounds." *Id.* at 103.

Franklin reads *Baker v. Selden* as "stand[ing] for several fundamental principles, each presenting ... an insuperable obstacle to the copyrightability of Apple's operating systems." It states:

> *First, Baker* teaches that use of a system itself does not infringe a copyright on the description of the system. *Second, Baker* enunciates the rule that copyright does not extend to purely utilitarian works. *Finally, Baker* emphasizes that the copyright laws may not be used to obtain and hold a monopoly over an idea. In so doing, *Baker* highlights the principal difference between the copyright and patent laws—a difference that is highly pertinent in this case.

Brief of Appellee at 22.

Section 102(b) of the Copyright Act, the other ground on which Franklin relies, appeared first in the 1976 version, long after the decision in *Baker v. Selden*. It provides:

> In no case does copyright protection for an original work of authorship extend to any idea, procedure, process, system, method of operation, concept, principle, or discovery, regardless of the form in which it is described, explained, illustrated, or embodied in such work.

It is apparent that section 102(b) codifies a substantial part of the holding and dictum of *Baker v. Selden*. *See* 1 *Nimmer on Copyright* § 2.18[D], at 2-207.

We turn to consider the two principal points of Franklin's argument.

1. *"Process", "System" or "Method of Operation"*

[6, 7] Franklin argues that an operating system program is either a "process", "system", or "method of operation" and hence uncopyrightable.[8] Franklin correctly notes that underlying section 102(b) and many of the statements for which *Baker v. Selden* is cited is the distinction which must be made between property subject to the patent law, which protects discoveries, and that subject to copyright law, which protects the writings describing such discoveries. However,

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[8] We are unpersuaded by Franklin's initial contention that Apple is bound to this position because some of Apple's witnesses in the preliminary injunction hearing used these terms in describing the works in suit. As the CONTU Report itself recognized, the distinction between copyrightable computer programs and uncopyrightable processes or methods of operation does not always seem to "shimmer with clarity." CONTU Report at 18. The witnesses undoubtedly had the not uncommon difficulty of finding the precisely correct words of description in this field. It would be both unreasonable and arbitrary to consider the statements of non-lawyer witnesses without experience in using statutory language as words of art to be binding admissions against Apple.

Franklin's argument misapplies that distinction in this case. Apple does not seek to copyright the method which instructs the computer to perform its operating functions but only the instructions themselves. The method would be protected, if at all, by the patent law, an issue as yet unresolved. *See Diamond v. Diehr*, 450 U.S. 175, 101 S.Ct. 1048, 67 L.Ed.2d 155 (1981).

[8] Franklin's attack on operating system programs as "methods" or "processes" seems inconsistent with its concession that application programs are an appropriate subject of copyright. Both types of programs instruct the computer to do something. Therefore, it should make no difference for purposes of section 102(b) whether these instructions tell the computer to help prepare an income tax return (the task of an application program) or to translate a high level language program from source code into its binary language object code form (the task of an operating system program such as "Applesoft", *see* note 4 *supra*). Since it is only the instructions which are protected, a "process" is no more involved because the instructions in an operating system program may be used to activate the operation of the computer than it would be if instructions were written in ordinary English in a manual which described the necessary steps to activate an intricate complicated machine. There is, therefore, no reason to afford any less copyright protection to the instructions in an operating system program than to the instructions in an application program.

Franklin's argument, receptively treated by the district court, that an operating system program is part of a machine mistakenly focuses on the physical characteristics of the instructions. But the medium is not the message. We have already considered and rejected aspects of this contention in the discussion of object code and ROM. The mere fact that the operating system program may be etched on a ROM does not make the program either a machine, part of a machine or its equivalent. Furthermore, as one of Franklin's witnesses testified, an operating system does not have to be permanently in the machine in ROM, but it may be on some other medium, such as a diskette or magnetic tape, where it could be readily transferred into the temporary memory space of the computer. In fact, some of the operating systems at issue were on diskette. As the CONTU majority stated,

> Programs should no more be considered machine parts than videotapes should be considered parts of projectors or phonorecords parts of sound reproduction equipment.... That the words of a program are used ultimately in the implementation of a process should in no way affect their copyrightability.

CONTU Report at 21.

Franklin also argues that the operating systems cannot be copyrighted because they are "purely utilitarian works" and that Apple is seeking to block the use of the art embodied in its operating systems. This argument stems from the following dictum in *Baker v. Selden:*

> The very object of publishing a book on science or the useful arts is to communicate to the world the useful knowledge which it contains. But this object would be frustrated if the knowledge could not be used without incurring the guilt of piracy of the book. And where the art it teaches cannot be used without employing the methods and diagrams used to illustrate the book, or such as are similar to them, such methods and diagrams are to be considered as necessary incidents to the art, and given therewith to the public; not given for the purpose of publication in other works explanatory of the art, but for the purpose of practical application.

101 U.S. at 103. We cannot accept the expansive reading given to this language by some courts, *see, e.g., Taylor Instrument Companies v. Fawley-Brost Co.*, 139 F.2d 98 (7th Cir.1943), *cert. denied*, 321 U.S. 785, 64 S.Ct. 782, 88 L.Ed. 1076 (1944). In this respect we agree with the views expressed by Professor Nimmer in his treatise. *See* 1 *Nimmer on Copyright* § 2.18[C].

Although a literal construction of this language could support Franklin's reading that precludes copyrightability if the copyright work is put to a utilitarian use, that interpretation has been rejected by a later Supreme Court decision. In *Mazer v. Stein,* 347 U.S. 201, 218, 74 S.Ct. 460, 471, 98 L.Ed. 630 (1954), the Court stated: "We find nothing in the copyright statute to support the argument that the intended use or use in industry of an article eligible for copyright bars or invalidates its registration. We do not read such a limitation into the copyright law." *Id.* at 218, 74 S.Ct. at 471. The CONTU majority also rejected the expansive view some courts have given *Baker v. Selden,* and stated, "That the words of a program are used ultimately in the implementation of a process should in no way affect their copyrightability." *Id.* at 21. It referred to "copyright practice past and present, which recognizes copyright protection for a work of authorship regardless of the uses to which it may be put." *Id.* The Commission continued: "The copyright status of the written rules for a game *or a system for the operation of a machine* is unaffected by the fact that those rules direct the actions of those who play the game or *carry out the process.*" *Id.* (emphasis added). As we previously noted, we can consider the CONTU Report as accepted by Congress since Congress wrote into the law the majority's recommendations almost verbatim. *See* 18 Cong.Rec. H10767 (daily ed. Nov. 17, 1980) (Rep. Kastenmeier: Bill "eliminates confusion about the legal status of computer software by enacting the recommendations of [CONTU] clarifying the law of copyright of computer software"); 18 Cong.Rec. S14766 (daily ed. Nov. 20, 1980) (Sen. Bayh: "[t]his language reflects that proposed by [CONTU"]).

Perhaps the most convincing item leading us to reject Franklin's argument is that the statutory definition of a computer program as a set of instructions to be used in a computer in order to bring about a certain result, 17 U.S.C. § 101, makes no distinction between application programs and operating programs. Franklin can point to no decision which adopts the distinction it seeks to make. In the one other reported case to have considered it, *Apple Computer, Inc. v. Formula International, Inc.,* 562 F.Supp. 775 (C.D.Cal.1983), the court reached the same conclusion which we do, *i.e.* that an operating system program is not *per se* precluded from copyright. It stated, "There is nothing in any of the statutory terms which suggest a different result for different types of computer programs based upon the function they serve within the machine." *Id.* at 780. Other courts have also upheld the copyrightability of operating programs without discussion of this issue. *See Tandy Corp. v. Personal Micro Computers, Inc.,* 524 F.Supp. at 173 (input-output routine stored in ROM which translated input into machine language in a similar fashion as Applesoft and Apple Integer Basic proper subject of copyright); *GCA Corp. v. Chance,* 217 U.S.P.Q. at 719–20 (object code version of registered source code version of operating programs is the same work and protected).

2. *Idea/Expression Dichotomy*

Franklin's other challenge to copyright of operating system programs relies on the line which is drawn between ideas and their expression. *Baker v. Selden* remains a benchmark in the law of copyright for the reading given it in *Mazer v. Stein, supra,* where the Court stated, "Unlike a patent, a copyright gives no exclusive right to the art disclosed; protection is given only to the expression of the idea—not the idea itself." 347 U.S. at 217, 74 S.Ct. at 470 (footnote omitted).

The expression/idea dichotomy is now expressly recognized in section 102(b) which precludes copyright for "any idea." This provision was not intended to enlarge or contract the scope of copyright protection but "to restate ... that the basic dichotomy between expression and idea remains unchanged." H.R.Rep. No. 1476, *supra,* at 57, *reprinted in* 1976 U.S.Code Cong. & Ad. News at 5670. The legislative history indicates that section 102(b) was intended "to make clear that the expression adopted by the programmer is the copyrightable element in a computer program, and that the actual processes or methods embodied in the program are not within the scope of the copyright law." *Id.*

Many of the courts which have sought to draw the line between an idea and expression have found difficulty in articulating where it falls. *See, e.g., Nichols v. Universal Pictures Corp.,* 45 F.2d 119, 121 (2d Cir.1930) (L. Hand, J.); *see* discussion in 3 *Nimmer on Copyright* § 13.03[A]. We believe that in the context before us, a program for an operating system, the line must be a pragmatic one, which also keeps in consideration "the preservation of the balance between competition and protection reflected in the patent and copyright laws". *Herbert Rosenthal Jewelry Corp. v. Kalpakian,* 446 F.2d 738, 742 (9th Cir.1971). As we stated in *Franklin Mint Corp. v. National Wildlife Art Exchange, Inc.,* 575 F.2d 62, 64 (3d Cir.), *cert. denied,* 439 U.S. 880, 99 S.Ct. 217, 58 L.Ed.2d 193 (1978), "Unlike a patent, a copyright protects originality rather than novelty or invention." In that opinion, we quoted approvingly the following passage from *Dymow v. Bolton,* 11 F.2d 690, 691 (2d Cir.1926):

> Just as a patent affords protection only to the means of reducing an inventive idea to practice, so the copyright law protects the means of expressing an idea; and it is as near the whole truth as generalization can usually reach that, *if the same idea can be expressed in a plurality of totally different manners, a plurality of copyrights may result,* and no infringement will exist.

(emphasis added).

[9] We adopt the suggestion in the above language and thus focus on whether the idea is capable of various modes of expression. If other programs can be written or created which perform the same function as an Apple's operating system program, then that program is an expression of the idea and hence copyrightable. In essence, this inquiry is no different than that made to determine whether the expression and idea have merged, which has been stated to occur where there are no or few other ways of expressing a particular idea. *See, e.g., Morrissey v. Procter & Gamble Co.,* 379 F.2d 675, 678–79 (1st Cir. 1967); *Freedman v. Grolier Enterprises, Inc.,* 179 U.S.P.Q. 476, 478 (S.D.N.Y.1973) ("[c]opyright protection will not be given to a form of expression necessarily dictated by the underlying subject matter"); CONTU Report at 20.

The district court made no findings as to whether some or all of Apple's operating programs represent the only means of expression of the idea underlying them. Although there seems to be a concession by Franklin that at least some of the programs can be rewritten, we do not believe that the record on that issue is so clear that it can be decided at the appellate level. Therefore, if the issue is pressed on remand, the necessary finding can be made at that time.

Franklin claims that whether or not the programs can be rewritten, there are a limited "number of ways to arrange operating systems to enable a computer to run the vast body of Apple-compatible software", Brief of Appellee at 20. This claim has no pertinence to either the idea/expression dichotomy or merger. The idea which may merge with the expression, thus making the copyright unavailable, is the idea which is the subject of the expression. The idea of one of the operating system programs is, for example, how to translate source code into object code. If other methods of expressing that idea are not foreclosed as a practical matter, then there is no merger. Franklin may wish to achieve total compatibility with independently developed application programs written for the Apple II, but that is a commercial and competitive objective which does not enter into the somewhat metaphysical issue of whether particular ideas and expressions have merged.

[10] In summary, Franklin's contentions that operating system programs are *per se* not copyrightable is unpersuasive. The other courts before whom this issue has been raised have rejected the distinction. Neither the CONTU majority nor Congress made a distinction between operating and application programs. We believe that the

1980 amendments reflect Congress' receptivity to new technology and its desire to encourage, through the copyright laws, continued imagination and creativity in computer programming. Since we believe that the district court's decision on the preliminary injunction was, to a large part, influenced by an erroneous view of the availability of copyright for operating system programs and unnecessary concerns about object code and ROMs, we must reverse the denial of the preliminary injunction and remand for reconsideration.

D.

Irreparable Harm

[11] The district court, without any extended discussion, found that Apple had not made the requisite showing of irreparable harm, stating "Apple is better suited to withstand whatever injury it might sustain during litigation than is Franklin to withstand the effects of a preliminary injunction." 545 F.Supp. at 812, 825. In so ruling, the district court failed to consider the prevailing view that a showing of a prima facie case of copyright infringement or reasonable likelihood of success on the merits raises a presumption of irreparable harm. *See, e.g., Atari, Inc. v. North American Philips Consumer Electronics Corp.*, 672 F.2d 607, 620 (7th Cir.), *cert. denied*, — U.S. —, 103 S.Ct. 176, 74 L.Ed.2d 145 (1982); *Wainwright Securities Inc. v. Wall Street Transcript Corp.*, 558 F.2d 91, 94 (2d Cir.1977), *cert. denied*, 434 U.S. 1014, 98 S.Ct. 730, 54 L.Ed.2d 759 (1978); *Klitzner Industries, Inc. v. H.K. James & Co.*, 535 F.Supp. 1249, 1259 (E.D.Pa.1982); *Custom Decor, Inc. v. Nautical Crafts Inc.*, 502 F.Supp. 154, 157 (E.D.Pa.1980). A copyright plaintiff who makes out a prima facie case of infringement is entitled to a preliminary injunction without a detailed showing of irreparable harm. *See* 3 *Nimmer on Copyright* § 14.06[A], at 14–50, 14–51 & n. 16 (collecting authorities).

[12] The CONTU Final Report recognized that "[t]he cost of developing computer programs is far greater than the cost of their duplication." CONTU Report at 11. Apple introduced substantial evidence of the considerable time and money it had invested in the development of the computer programs in suit. Thus even without the presumption of irreparable harm generally applied in copyright infringement cases, the jeopardy to Apple's investment and competitive position caused by Franklin's wholesale copying of many of its key operating programs would satisfy the requirement of irreparable harm needed to support a preliminary injunction. *See Atari, Inc. v. North American Philips Consumer Electronics Corp.*, 672 F.2d at 620; *Custom Decor, Inc. v. Nautical Crafts Inc.*, 502 F.Supp. 154, 157 (E.D.Tenn.1980); *Herbert Rosenthal Jewelry Corp. v. Zale Corp.*, 323 F.Supp. 1234, 1238 (S.D.N.Y.1971).

[13] In *Kontes Glass Co. v. Lab Glass, Inc.*, 373 F.2d 319, 320–21 (3d Cir.1967), this court appeared to adopt an inverse relationship approach to the irreparable harm issue, suggesting that the strength of the required showing of irreparable injury varies inversely with the strength of plaintiff's showing of a likelihood of success on the merits. *See Midway Mfg. Co. v. Bandai-America, Inc.*, 546 F.Supp. 125, 141–42 (D.N.J.1982). In *Kontes*, we were not presented with a case in which copyrighted material central to the essence of plaintiff's operations was concededly copied, as we are here. We believe the *Kontes* approach is best suited to those cases where the injury, from copying can be fairly considered minimal, limited or conjectural. In those circumstances it provides flexibility in applying the equitable remedy of preliminary injunctions through evaluation of the irreparable harm factor. Normally, however, the public interest underlying the copyright law requires a presumption of irreparable harm, as long as there is, as here, adequate evidence of the expenditure of significant time, effort and money directed to the production of the copyrighted material. Otherwise, the rationale for protecting copyright, that of encouraging creativity, would be undermined. As Judge Broderick stated in *Klitzner Industries, Inc. v. H.K. James & Co.*, 535 F.Supp. at 1259–60:

Since Congress has elected to grant certain exclusive rights to the owner of a copyright in a protected work, it is virtually axiomatic that the public interest can only be served by upholding copyright protections and, correspondingly, preventing the misappropriation of the skills, creative energies, and resources which are invested in the protected work.

[14] Nor can we accept the district court's explanation which stressed the "devastating effect" of a preliminary injunction on Franklin's business. If that were the correct standard, then a knowing infringer would be permitted to construct its business around its infringement, a result we cannot condone. *See Atari, Inc. v. North American Philips Consumer Electronics Corp.*, 672 F.2d at 620; *cf. Helene Curtis Industries, Inc. v. Church & Dwight Co.*, 560 F.2d 1325, 1333 (7th Cir.1977) (trademark infringement), *cert. denied*, 434 U.S. 1070, 98 S.Ct. 1252, 55 L.Ed.2d 772 (1978). The size of the infringer should not be determinative of the copyright holder's ability to get prompt judicial redress.

E.

Additional Issues

Franklin has raised a number of issues concerning Apple's compliance with various statutory formalities such as registration, notice and deposit. It has challenged, in a pending motion to dismiss, the copyrights of the eleven works in suit which were deposited in object code format, and which were registered under the Copyright Office's "rule of doubt."[9] Franklin challenges three programs, i.e. Apple Integer Basic, Autostart ROM and DOS 3.3, on the ground that they or their predecessors were published without the requisite notice. We do not reach these issues on appeal nor do we consider Franklin's claim that Apple's misuse of its copyrights bars their enforcement. The district court did not consider these claims in denying the motion for preliminary injunction. There are no factual findings with regard to them. On remand, they can be considered by the district court in the first instance who can also decide the extent to which they are relevant, if at all, to a preliminary injunction.

V.

For the reasons set forth in this opinion, we will reverse the denial of the preliminary injunction and remand to the district court for further proceedings in accordance herewith.

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[9] Apparently the Register of Copyrights utilizes its rule of doubt when the deposit of a computer program is made in object code form be-

NOTE: Where it is feasible, a syllabus (headnote) will be released, as is being done in connection with this case, at the time the opinion is issued. The syllabus constitutes no part of the opinion of the Court but has been prepared by the Reporter of Decisions for the convenience of the reader. See *United States* v. *Detroit Lumber Co.*, 200 U. S. 321, 337.

SUPREME COURT OF THE UNITED STATES

Syllabus

SONY CORPORATION OF AMERICA ET AL. *v.* UNIVERSAL CITY STUDIOS, INC., ET AL.

CERTIORARI TO THE UNITED STATES COURT OF APPEALS FOR THE NINTH CIRCUIT

No. 81-1687. Argued January 18, 1983—Reargued October 3, 1983—Decided January 17, 1984

Petitioner Sony Corp. manufactures home video tape recorders (VTR's), and markets them through retail establishments, some of which are also petitioners. Respondents own the copyrights on some of the television programs that are broadcast on the public airwaves. Respondents brought an action against petitioners in Federal District Court, alleging that VTR consumers had been recording some of respondents' copyrighted works that had been exhibited on commercially sponsored television and thereby infringed respondents' copyrights, and further that petitioners were liable for such copyright infringement because of their marketing of the VTR's. Respondents sought money damages, an equitable accounting of profits, and an injunction against the manufacture and marketing of the VTR's. The District Court denied respondents all relief, holding that noncommercial home use recording of material broadcast over the public airwaves was a fair use of copyrighted works and did not constitute copyright infringement, and that petitioners could not be held liable as contributory infringers even if the home use of a VTR was considered an infringing use. The Court of Appeals reversed, holding petitioners liable for contributory infringement and ordering the District Court to fashion appropriate relief.

Held: The sale of the VTR's to the general public does not constitute contributory infringement of respondents' copyrights. Pp. 10-36.

(a) The protection given to copyrights is wholly statutory, and, in a case like this, in which Congress has not plainly marked the course to be followed by the judiciary, this Court must be circumspect in construing the scope of rights created by a statute that never contemplated such a calculus of interests. Any individual may reproduce a copyrighted work for a "fair use"; the copyright owner does not possess the exclusive right to such a use. Pp. 10–16.

(b) *Kalem Co.* v. *Harper Brothers*, 222 U. S. 55, does not support respondents' novel theory that supplying the "means" to accomplish an infringing activity and encouraging that activity through advertisement are sufficient to establish liability for copyright infringement. This case does not fall in the category of those in which it is manifestly just to impose vicarious liability because the "contributory" infringer was in a position to control the use of copyrighted works by others and had authorized the use without permission from the copyright owner. Here, the only contact between petitioners and the users of the VTR's occurred at the moment of sale. And there is no precedent for imposing vicarious liability on the theory that petitioners sold the VTR's with constructive knowledge that their customers might use the equipment to make unauthorized copies of copyrighted material. The sale of copying equipment, like the sale of other articles of commerce, does not constitute contributory infringement if the product is widely used for legitimate, unobjectionable purposes, or, indeed, is merely capable of substantial noninfringing uses. Pp. 16–22.

(c) The record and the District Court's findings show (1) that there is a significant likelihood that substantial numbers of copyright holders who license their works for broadcast on free television would not object to having their broadcast time-shifted by private viewers (*i. e.*, recorded at a time when the VTR owner cannot view the broadcast so that it can be watched at a later time); and (2) that there is no likelihood that time-shifting would cause nonminimal harm to the potential market for, or the value of, respondents' copyrighted works. The VTR's are therefore capable of substantial noninfringing uses. Private, noncommercial time-shifting in the home satisfies this standard of noninfringing uses both because respondents have no right to prevent other copyright holders from authorizing such time-shifting for their programs, and because the District Court's findings reveal that even the unauthorized home time-shifting of respondents' programs is legitimate fair use. Pp. 22–35.

659 F. 2d 963, reversed.

STEVENS, J., delivered the opinion of the Court in which BURGER, C. J., and BRENNAN, WHITE, and O'CONNOR, JJ., joined. BLACKMUN, J., filed a dissenting opinion in which MARSHALL, POWELL, and REHNQUIST, JJ., joined.

NOTICE: This opinion is subject to formal revision before publication in the preliminary print of the United States Reports. Readers are requested to notify the Reporter of Decisions, Supreme Court of the United States, Washington, D. C. 20543, of any typographical or other formal errors, in order that corrections may be made before the preliminary print goes to press.

SUPREME COURT OF THE UNITED STATES

No. 81-1687

SONY CORPORATION OF AMERICA, ET AL., PETITIONERS *v.* UNIVERSAL CITY STUDIOS, INC., ETC., ET AL.

ON WRIT OF CERTIORARI TO THE UNITED STATES COURT OF APPEALS FOR THE NINTH CIRCUIT

[January 17, 1984]

JUSTICE STEVENS delivered the opinion of the Court.

Petitioners manufacture and sell home video tape recorders. Repondents own the copyrights on some of the television programs that are broadcast on the public airwaves. Some members of the general public use video tape recorders sold by petitioners to record some of these broadcasts, as well as a large number of other broadcasts. The question presented is whether the sale of petitioners' copying equipment to the general public violates any of the rights conferred upon respondents by the Copyright Act.

Respondents commenced this copyright infringment action against petitioners in the United States District Court for the Central District of California in 1976. Respondents alleged that some individuals had used Betamax video tape recorders (VTR's) to record some of respondents' copyrighted works which had been exhibited on commercially sponsored television and contended that these individuals had thereby infringed respondents' copyrights. Respondents further maintained that petitioners were liable for the copyright infringment allegedly committed by Betamax consumers because of petitioners' marketing of the Betamax VTR's.[1] Respondents sought no relief against any Betamax consumer. Instead, they sought money damages and an equitable accounting of profits from petitioners, as well as an injunction against the manufacture and marketing of Betamax VTR's.

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[1] The respondents also asserted causes of action under state law and § 43(a) of the Trademark Act of 1946, 60 Stat. 441, 15 U. S. C. § 1125(a).

After a lengthy trial, the District Court denied respondents all the relief they sought and entered judgment for petitioners. 480 F. Supp. 429 (1979). The United States Court of Appeals for the Ninth Circuit reversed the District Court's judgment on respondent's copyright claim, holding petitioners liable for contributory infringment and ordering the District Court to fashion appropriate relief. 659 F. 2d 963 (1981). We granted certiorari, 457 U. S. 1116 (1982); since we had not completed our study of the case last Term, we ordered reargument, —— U. S. —— (1983). We now reverse.

An explanation of our rejection of respondents' unprecedented attempt to impose copyright liability upon the distributors of copying equipment requires a quite detailed recitation of the findings of the District Court. In summary, those findings reveal that the average member of the public uses a VTR principally to record a program he cannot view as it is being televised and then to watch it once at a later time. This practice, known as "time-shifting," enlarges the television viewing audience. For that reason, a significant amount of television programming may be used in this manner without objection from the owners of the copyrights on the programs. For the same reason, even the two respondents in this case, who do assert objections to time-shifting in this litigation, were unable to prove that the practice has impaired the commercial value of their copyrights or has created any likelihood of future harm. Given these findings, there is no basis in the Copyright Act upon which respondents can hold petitioners liable for distributing VTR's to the general public. The Court of Appeals' holding that respondents are entitled to enjoin the distribution of VTR's, to collect

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These claims are not before this Court.

royalties on the sale of such equipment, or to obtain other relief, if affirmed, would enlarge the scope of respondents' statutory monopolies to encompass control over an article of commerce that is not the subject of copyright protection. Such an expansion of the copyright privilege is beyond the limits of the grants authorized by Congress.

I

The two respondents in this action, Universal Studios, Inc. and Walt Disney Productions, produce and hold the copyrights on a substantial number of motion pictures and other audiovisual works. In the current marketplace, they can exploit their rights in these works in a number of ways: by authorizing theatrical exhibitions, by licensing limited showings on cable and network television, by selling syndication rights for repeated airings on local television stations, and by marketing programs on prerecorded videotapes or videodiscs. Some works are suitable for exploitation through all of these avenues, while the market for other works is more limited.

Petitioner Sony manufactures millions of Betamax video tape recorders and markets these devices through numerous retail establishments, some of which are also petitioners in this action.[1] Sony's Betamax VTR is a mechanism consisting of three basic components: (1) a tuner, which receives electromagnetic signals transmitted over the television band of the public airwaves and separates them into audio and visual signals; (2) a recorder, which records such signals on a magnetic tape; and (3) an adapter, which converts the audio and visual signals on the tape into a composite signal that can be received by a television set.

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[1] The four retailers are Carter, Hawley, Hales, Stores, Inc.; Associated Dry Goods Corp.; Federated Department Stores, Inc.; and Henry's Camera Corp. The principal defendants are Sony Corporation, the manufacturer of the equipment, and its wholly owned subsidiary, Sony Corporation of America. The advertising agency of Doyle, Dane, Burnbock, Inc., also involved in marketing the Betamax, is also a petitioner. An individual VTR user, Willis Griffiths, was named as a defendant in the District Court, but respondent sought no relief against him. Griffiths is not a petitioner. For convenience, we shall refer to petitioners collectively as Sony.

Several capabilities of the machine are noteworthy. The separate tuner in the Betamax enables it to record a broadcast off one station while the television set is tuned to another channel, permitting the viewer, for example, to watch two simultaneous news broadcasts by watching one "live" and recording the other for later viewing. Tapes may be reused, and programs that have been recorded may be erased either before or after viewing. A timer in the Betamax can be used to activate and deactivate the equipment at predetermined times, enabling an intended viewer to record programs that are transmitted when he or she is not at home. Thus a person may watch a program at home in the evening even though it was broadcast while the viewer was at work during the afternoon. The Betamax is also equipped with a pause button and a fast-forward control. The pause button, when depressed, deactivates the recorder until it is released, thus enabling a viewer to omit a commercial advertisement from the recording, provided, of course, that the viewer is present when the program is recorded. The fast forward control enables the viewer of a previously recorded program to run the tape rapidly when a segment he or she does not desire to see is being played back on the television screen.

The respondents and Sony both conducted surveys of the way the Betamax machine was used by several hundred owners during a sample period in 1978. Although there were some differences in the surveys, they both showed that the primary use of the machine for most owners was "time-shifting,"—the practice of recording a program to view it once at a later time, and thereafter erasing it. Time-shifting enables viewers to see programs they otherwise would miss because they are not at home, are occupied with other tasks, or are viewing a program on another station at the time of a broadcast that they desire to watch. Both surveys also showed, however, that a substantial number of interviewees had accumulated libraries of tapes.[3] Sony's survey indicated that over 80% of the interviewees watched at least as much regular television as they had before owning a Betamax.[4] Respondents offered no evidence of decreased television viewing by Betamax owners.[5]

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[3] As evidence of how a VTR may be used, respondents offered the testimony of William Griffiths. Griffiths, although named as an individual defendant, was a client of plaintiffs' law firm. The District Court summarized his testimony as follows:

"He owns approximately 100 tapes. When Griffiths bought his Betamax, he intended not only to time-shift (record, play-back and then erase) but also to build a library of cassettes. Maintaining a library, however, proved too expensive, and he is now erasing some earlier tapes and reusing them.

"Griffiths copied about 20 minutes of a Universal motion picture called 'Never Give An Inch,' and two episodes from Universal television series entitled 'Baa Baa Black Sheep' and 'Holmes and Yo Yo.' He would have erased each of these but for the request of plaintiffs' counsel that it be kept. Griffiths also testified that he had copied but already erased Universal films called 'Alpha Caper' (erased before anyone saw it) and 'Amelia Earhart.' At the time of his deposition Griffiths did not intend to keep any Universal film in his library.

"Griffiths has also recorded documentaries, news broadcasts, sporting events and political programs such as a rerun of the Nixon/Kennedy debate." 480 F. Supp., at 436–437.

Four other witnesses testified to having engaged in similar activity.

[4] The District Court summarized some of the findings in these surveys as follows:

"According to plaintiffs' survey, 75.4% of the VTR owners use their machines to record for time-shifting purposes half or most of the time. Defendants' survey showed that 96% of the Betamax owners had used the machine to record programs they otherwise would have missed.

"When plaintiffs asked interviewees how many cassettes were in their library, 55.8% said there were 10 or fewer. In defendants' survey, of the total programs viewed by interviewees in the past month, 70.4% had been viewed only that one time and for 57.9%, there were no plans for further viewing." 480 F. Supp., at 4[illegible]3.

[5] "81.9% of the defendants' interviewees watched the same amount or more of regular television as they did before owning a Betamax. 83.2%

Sony introduced considerable evidence describing television programs that could be copied without objection from any copyright holder, with special emphasis on sports, religious, and educational programming. For example, their survey indicated that 7.3% of all Betamax use is to record sports events, and representatives of professional baseball, football, basketball, and hockey testified that they had no objection to the recording of their televised events for home use.[6]

Respondents offered opinion evidence concerning the future impact of the unrestricted sale of VTR's on the commercial value of their copyrights. The District Court found, however, that they had failed to prove any likelihood of future harm from the use of VTR's for time-shifting. *Id.*, at 469.

The District Court's Decision

The lengthy trial of the case in the District Court concerned the private, home use of VTR's for recording programs broadcast on the public airwaves without charge to the viewer.[7] No issue concerning the transfer of tapes to other persons, the use of home-recorded tapes for public performances, or the copying of programs transmitted on pay or cable television systems was raised. See 480 F. Supp. 429, 432–433, 442 (1979).

The District Court concluded that noncommercial home use recording of material broadcast over the public airwaves was a fair use of copyrighted works and did not constitute copy-

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reported their frequency of movie going was unaffected by Betamax." 480 F. Supp., at 439.

[6] See Def. Exh. OT, Table 20; Tr. 2447–2450, 2480, 2486–2487, 2515–2516, 2530–2534.

[7] The trial also briefly touched upon demonstrations of the Betamax by the retailer petitioners which were alleged to be infringments by respondents. The District Court held against respondents on this claim, 480 F. Supp., at 456–457, the Court of Appeals affirmed this holding, 659 F. 2d, at 976, and respondents did not cross-petition on this issue.

right infringement. It emphasized the fact that the material was broadcast free to the public at large, the noncommercial character of the use, and the private character of the activity conducted entirely within the home. Moreover, the court found that the purpose of this use served the public interest in increasing access to television programming, an interest that "is consistent with the First Amendment policy of providing the fullest possible access to information through the public airwaves. *Columbia Broadcasting System, Inc.* v. *Democratic National Committee,* 412 U. S. 94, 102." 480 F. Supp., at 454.[8] Even when an entire copyrighted work was recorded, the District Court regarded the copying as fair use "because there is no accompanying reduction in the market for 'plaintiff's original work.'" *Ibid.*

As an independent ground of decision, the District Court also concluded that Sony could not be held liable as a contributory infringer even if the home use of a VTR was considered an infringing use. The District Court noted that Sony had no direct involvement with any Betamax purchasers who recorded copyrighted works off the air. Sony's advertising was silent on the subject of possible copyright infringement, but its instruction booklet contained the following statement:

> "Television programs, films, videotapes and other materials may be copyrighted. Unauthorized recording of such material may be contrary to the provisions of the United States copyright laws." *Id.*, at 436.

The District Court assumed that Sony had constructive knowledge of the probability that the Betamax machine would be used to record copyrighted programs, but found that Sony merely sold a "product capable of a variety of uses, some of them allegedly infringing." *Id.*, at 461. It reasoned:

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[8] The court also found that this "access is not just a matter of convenience, as plaintiffs have suggested. Access has been limited not simply by inconvenience but by the basic need to work. Access to the better program has also been limited by the competitive practice of counterprogramming." 480 F. Supp., at 454.

> "Selling a staple article of commerce *e. g.*, a typewriter, a recorder, a camera, a photocopying machine technically contributes to any infringing use subsequently made thereof, but this kind of 'contribution,' if deemed sufficient as a basis for liability, would expand the theory beyond precedent and arguably beyond judicial management.
>
> "Commerce would indeed be hampered if manufacturers of staple items were held liable as contributory infringers whenever they 'constructively' knew that some purchasers on some occasions would use their product for a purpose which a court later deemed, as a matter of first impression, to be an infringement." *Ibid.*

Finally, the District Court discussed the respondents' prayer for injunctive relief, noting that they had asked for an injunction either preventing the future sale of Betamax machines, or requiring that the machines be rendered incapable of recording copyrighted works off the air. The court stated that it had "found no case in which the manufacturers, distributors, retailers, and advertisors of the instrument enabling the infringement were sued by the copyright holders," and that the request for relief in this case "is unique." 480 F. Supp., at 465.

It concluded that an injunction was wholly inappropriate because any possible harm to respondents was outweighed by the fact that "the Betamax could still legally be used to record noncopyrighted material or material whose owners consented to the copying. An injunction would deprive the public of the ability to use the Betamax for this noninfringing off-the-air recording." 480 F. Supp., at 468.

The Court of Appeals' Decision

The Court of Appeals reversed the District Court's judgment on respondents' copyright claim. It did not set aside any of the District Court's findings of fact. Rather, it concluded as a matter of law that the home use of a VTR was not a fair use because it was not a "productive use."[9] It therefore held that it was unnecessary for plaintiffs to prove any harm to the potential market for the copyrighted works, but then observed that it seemed clear that the cumulative effect of mass reproduction made possible by VTR's would tend to diminish the potential market for respondents' works. 659 F. 2d, at 974.

On the issue of contributory infringement, the Court of Appeals first rejected the analogy to staple articles of commerce such as tape recorders or photocopying machines. It noted that such machines "may have substantial benefit for some purposes" and do not "even remotely raise copyright problems." *Id.*, at 975. VTR's, however, are sold "for the primary purpose of reproducing television programming" and "virtually all" such programming is copyrighted material. *Ibid.* The Court of Appeals concluded, therefore, that VTR's were not suitable for any substantial noninfringing use even if some copyright owners elect not to enforce their rights.

The Court of Appeals also rejected the District Court's reliance on Sony's lack of knowledge that home use constituted infringement. Assuming that the statutory provisions defining the remedies for infringement applied also to the nonstatutory tort of contributory infringement, the court stated that a defendant's good faith would merely reduce his damages liability but would not excuse the infringing conduct. It held that Sony was chargeable with knowledge of the homeowner's infringing activity because the reproduction of copyrighted materials was either "the most conspicuous use" or "the major use" of the Betamax product. *Ibid.*

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[9] "Without a 'productive use', *i. e.* when copyrighted material is reproduced for its intrinsic use, the mass copying of the sort involved in this case precludes an application of fair use." 659 F. 2d, at 971–972.

On the matter of relief, the Court of Appeals concluded that "statutory damages may be appropriate," that the District Court should reconsider its determination that an injunction would not be an appropriate remedy; and, referring to "the analogous photocopying area," suggested that a continuing royalty pursuant to a judicially created compulsory license may very well be an acceptable resolution of the relief issue. 659 F. 2d, at 976.

II

Article I, Sec. 8 of the Constitution provides that:

> "The Congress shall have Power . . . to Promote the Progress of Science and useful Arts, by securing for limited Times to Authors and Inventors the exclusive Right to their respective Writings and Discoveries."

The monopoly privileges that Congress may authorize are neither unlimited nor primarily designed to provide a special private benefit. Rather, the limited grant is a means by which an important public purpose may be achieved. It is intended to motivate the creative activity of authors and inventors by the provision of a special reward, and to allow the public access to the products of their genius after the limited period of exclusive control has expired.

> "The copyright law, like the patent statute, makes reward to the owner a secondary consideration. In *Fox Film Corp.* v. *Doyal*, 286 U. S. 123, 127, Chief Justice Hughes spoke as follows respecting the copyright monopoly granted by Congress, 'The sole interest of the United States and the primary object in conferring the monopoly lie in the general benefits derived by the public from the labors of authors.' It is said that reward to the author or artist serves to induce release to the public of the products of his creative genius." *United States* v. *Paramount Pictures*, 334 U. S. 131, 158.

As the text of the Constitution makes plain, it is Congress that has been assigned the task of defining the scope of the limited monopoly that should be granted to authors or to inventors in order to give the public appropriate access to their work product. Because this task involves a difficult balance between the interests of authors and inventors in the control and exploitation of their writings and discoveries on the one hand, and society's competing interest in the free flow of ideas, information, and commerce on the other hand, our patent and copyright statutes have been amended repeatedly.[10]

From its beginning, the law of copyright has developed in response to significant changes in technology.[11] Indeed, it

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[10] In its report accompanying the comprehensive revision of the Copyright Act in 1909, the Judiciary Committee of the House of Representatives explained this balance:

"The enactment of copyright legislation by Congress under the terms of the Constitution is not based upon any natural right that the author has in his writings, . . . but upon the ground that the welfare of the public will be served and progress of science and useful arts will be promoted by securing to authors for limited periods the exclusive rights to their writings.

* * * * *

"In enacting a copyright law Congress must consider . . . two questions: First, how much will the legislation stimulate the producer and so benefit the public, and, second, how much will the monopoly granted be detrimental to the public? The granting of such exclusive rights, under the proper terms and conditions, confers a benefit upon the public that outweighs the evils of the temporary monopoly." H. R. Rep. No. 2222, 60th Cong., 2d Sess. 7 (1909).

[11] Thus, for example, the development and marketing of player pianos and perforated roles of music, see *White Smith Music Publishing Co.* v. *Apollo Co.*, 209 U. S. 1 (1908), preceded the enactment of the Copyright Act of 1909; innovations in copying techniques gave rise to the statutory exemption for library copying embodied in § 108 of the 1976 revision of the Copyright law; the development of the technology that made it possible to retransmit television programs by cable or by microwave systems, see *Fortnightly Corp.* v. *United Artists*, 392 U. S. 390 (1968), and *Teleprompter Corp.* v. *CBS*, 415 U. S. 394 (1974), prompted the enactment of the complex provisions set forth in 17 U. S. C. § 111 (d)(2)(B) and § 111(d)(5) after years of detailed congressional study, see *Eastern Microwave, Inc.* v. *Doubleday Sports, Inc.*, 691 F. 2d 125, 129 (CA2 1982).

By enacting the Sound Recording Amendment of 1971, 85 Stat. 391, Congress also provided the solution to the "record piracy" problems that was the invention of a new form of copying equipment—the printing press—that gave rise to the original need for copyright protection.[12] Repeatedly, as new developments have occurred in this country, it has been the Congress that has fashioned the new rules that new technology made necessary. Thus, long before the enactment of the Copyright Act of 1909, 35 Stat. 1075, it was settled that the protection given to copyrights is wholly statutory. *Wheaton* v. *Peters*, 33 U. S. (8 Peters) 591, 661–662 (1834). The remedies for infringement "are only those prescribed by Congress." *Thompson* v. *Hubbard*, 131 U. S. 123, 151 (1889).

The judiciary's reluctance to expand the protections afforded by the copyright without explicit legislative guidance is a recurring theme. See, e. g., *Teleprompter Corp.* v. *CBS*, 415 U. S. 394 (1974); *Fortnightly Corp.* v. *United Artists*, 392 U. S. 390 (1968); *White-Smith Music Publishing Co.* v. *Apollo Co.*, 209 U. S. 1 (1908); *Williams and Wilkins* v. *United States*, 487 F. 2d 1345 (Ct. Cl. 1973), affirmed by an equally divided court, 420 U. S. 376 (1975). Sound policy, as well as history, supports our consistent deference to Congress when major technological innovations alter the market for copyrighted materials. Congress has the constitutional

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had been created by the development of the audio tape recorder. Sony argues that the legislative history of that Act, see especially H. Rep. No. 487, 92nd Cong., 1st Sess., p. 7, indicates that Congress did not intend to prohibit the private home use of either audio or video tape recording equipment. In view of our disposition of the contributory infringement issue, we express no opinion on that question.

[12] "Copyright protection became necessary with the invention of the printing press and had its early beginnings in the British censorship laws. The fortunes of the law of copyright have always been closely connected with freedom of expression, on the one hand, and with technological improvements in means of dissemination, on the other. Successive ages have drawn different balances among the interest of the writer in the control and exploitation of his intellectual property, the related interest of the publisher, and the competing interest of society in the untrammeled dissemination of ideas." Foreword to B. Kaplan, An Unhurried View of Copyright vii–viii (1967).

authority and the institutional ability to accomodate fully the varied permutations of competing interests that are inevitably implicated by such new technology.

In a case like this, in which Congress has not plainly marked our course, we must be circumspect in construing the scope of rights created by a legislative enactment which never contemplated such a calculus of interests. In doing so, we are guided by Justice Stewart's exposition of the correct approach to ambiguities in the law of copyright:

> "The limited scope of the copyright holder's statutory monopoly, like the limited copyright duration required by the Constitution, reflects a balance of competing claims upon the public interest: Creative work is to be encouraged and rewarded, but private motivation must ultimately serve the cause of promoting broad public availability of literature, music, and the other arts. The immediate effect of our copyright law is to secure a fair return for an 'author's' creative labor. But the ultimate aim is, by this incentive, to stimulate artistic creativity for the general public good. 'The sole interest of the United States and the primary object in conferring the monopoly,' this Court has said, 'lie in the general benefits derived by the public from the labors of authors.' *Fox Film Corp.* v. *Doyal*, 286 U. S. 123, 127. See *Kendall* v. *Winsor*, 21 How. 322, 327–328; *Grant* v. *Raymond*, 6 Pet. 218, 241–242. When technological change has rendered its literal terms ambiguous, the Copyright Act must be construed in light of this basic purpose." *Twentieth Century Music Corp.* v. *Aiken*, 422 U. S. 151, 156 (footnotes omitted).

Copyright protection "subsists . . . in original works of authorship fixed in any tangible medium of expression." 17 U. S. C. § 102(a). This protection has never accorded the copyright owner complete control over all possible uses of his work.[13] Rather, the Copyright Act grants the copyright holder "exclusive" rights to use and to authorize the use of his work in five qualified ways, including reproduction of the copyrighted work in copies. *Id.*, § 106.[14] All reproductions of the work, however, are not within the exclusive domain of the copyright owner; some are in the public domain. Any individual may reproduce a copyrighted work for a "fair use;" the copyright owner does not possess the exclusive right to such a use. Compare *id.*, § 106 with *id.*, § 107.

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[13] See, *e. g., White Smith Music Publishing Co.* v. *Apollo Co.*, 209 U. S. 1, 19 (1908); cf. *Deep South Packing Co.* v. *Lathram Corp.*, 406 U. S. 518, 530–531 (1972). While the law has never recognized an author's right to absolute control of his work, the natural tendency of legal rights to express themselves in absolute terms to the exclusion of all else is particularly pronounced in the history of the constitutionally sanctioned monopolies of the copyright and the patent. See *e. g., United States* v. *Paramount Pictures*, 334 U. S. 131, 156–158 (1948) (copyright owners claiming right to tie license of one film to license of another under copyright law); *Fox Film Corp.* v. *Doyal*, 286 U. S. 106 (1932) (copyright owner claiming copyright renders it immune from state taxation of copyright royalties); *Bobbs-Merrill Co.* v. *Straus*, 210 U. S. 339, 349–351 (1908) (copyright owner claiming that a right to fix resale price of his works within the scope of his copyright); *International Business Machines* v. *United States*, 298 U. S. 131 (1936) (patentees claiming right to tie sale of unpatented article to lease of patented device).

[14] Section 106 of the Act provides:

"'Subject to sections 107 through 118, the owner of copyright under this title has the exclusive rights to do and to authorize any of the following:

(1) to reproduce the copyrighted work in copies or phonorecords;

(2) to prepare derivative works based upon the copyrighted work;

(3) to distribute copies or phonorecords of the copyrighted work to the public by sale or other transfer of ownership, or by rental, lease, or lending;

(4) in the case of literary, musical, dramatic, and choreographic works, pantomimes, and motion pictures and other audiovisual works, to perform the copyrighted work publicly; and

(5) in the case of literary, musical, dramatic, and choreographic works, pantomimes, and pictorial, graphic, or sculptural works, including the individual images of a motion picture or other audiovisual work, to display the copyrighted work publicly."

"Anyone who violates any of the exclusive rights of the copyright owner," that is, anyone who trespasses into his exclusive domain by using or authorizing the use of the copyrighted work in one of the five ways set forth in the statute, "is an infringer of the copyright." *Id.*, § 501(a). Conversely, anyone who is authorized by the copyright owner to use the copyrighted work in a way specified in the statute or who makes a fair use of the work is not an infringer of the copyright with respect to such use.

The Copyright Act provides the owner of a copyright with a potent arsenal of remedies against an infringer of his work, including an injunction to restrain the infringer from violating his rights, the impoundment and destruction of all reproductions of his work made in violation of his rights, a recovery of his actual damages and any additional profits realized by the infringer or a recovery of statutory damages, and attorneys fees. *Id.*, §§ 502–505.[15]

The two respondents in this case do not seek relief against the Betamax users who have allegedly infringed their copyrights. Moreover, this is not a class action on behalf of all copyright owners who license their works for television broadcast, and respondents have no right to invoke whatever rights other copyright holders may have to bring infringement actions based on Betamax copying of their works.[16] As was made clear by their own evidence, the copying of the respondents' programs represents a small portion of the total use of VTR's. It is, however, the taping of respondents own copyrighted programs that provides them with standing to charge Sony with contributory infringement. To prevail, they have the burden of proving that users of the Betamax have infringed their copyrights and that Sony should be held responsible for that infringement.

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[15] Moreover, anyone who willfully infringes the copyright to reproduce a motion picture for purposes of commercial advantage or private financial gain is subject to criminal penalties of one year imprisonment and a $25,000 fine for the first offense and two years imprisonment and a $50,000 fine for each subsequent offense, 17 U. S. C. § 506(a), and the fruits and instrumentalities of the crime are forfeited upon conviction, id., § 506(b).

[16] In this regard, we reject respondent's attempt to cast this action as comparable to a class action because of the positions taken by *amici* with copyright interests and their attempt to treat the statements made by *amici* as evidence in this case. See Brief for Respondent, at 1, and n. 1, 6, 52, 53 and n. 116. The stated desires of *amici* concerning the outcome of this or any litigation are no substitute for a class action, are not evidence in the case, and do not influence our decision; we examine an *amicus curiae*

III

The Copyright Act does not expressly render anyone liable for infringment committed by another. In contrast, the Patent Act expressly brands anyone who "actively induces infringment of a patent" as an infringer, 35 U. S. C. § 271(b), and further imposes liability on certain individuals labeled "contributory" infringers, *id.*, § 271(c). The absence of such express language in the copyright statute does not preclude the imposition of liability for copyright infringments on certain parties who have not themselves engaged in the infringing activity.[17] For vicarious liability is imposed in virtually

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brief solely for whatever aid it provides in analyzing the legal questions before us.

[17] As the District Court correctly observed, however, "the lines between direct infringement, contributory infringment, and vicarious liability are not clearly drawn. . . ." 480 F. Supp. 457–458. The lack of clarity in this area may, in part, be attributable to the fact that an infringer is not merely one who uses a work without authorization by the copyright owner, but also one who authorizes the use of a copyrighted work without actual authority from the copyright owner.

We note the parties' statements that the questions of petitioners' liability under the "doctrines" of "direct infringement" and "vicarious liability" are not nominally before this Court. Compare Respondents' Brief, at 9, n. 22, 41, n. 90 with Petitioners' Reply Brief, at 1, n. 2. We also observe, however, that reasoned analysis of respondents' unprecedented contributory infringement claim necessarily entails consideration of arguments and case law which may also be forwarded under the other labels, and indeed the parties to a large extent rely upon such arguments and authority in support of their respective positions on the issue of contributory infringement.

all areas of the law, and the concept of contributory infringement is merely a species of the broader problem of identifying the circumstances in which it is just to hold one individual accountable for the actions of another.

Such circumstances were plainly present in *Kalem Co.* v. *Harper Brothers*, 222 U. S. 55 (1911), the copyright decision of this Court on which respondents place their principal reliance. In *Kalem*, the Court held that the producer of an unauthorized film dramatization of the copyrighted book *Ben Hur* was liable for his sale of the motion picture to jobbers, who in turn arranged for the commercial exhibition of the film. Justice Holmes, writing for the Court, explained:

> "The defendant not only expected but invoked by advertisement the use of its films for dramatic reproduction of the story. That was the most conspicuous purpose for which they could be used, and the one for which especially they were made. If the defendant did not contribute to the infringement it is impossible to do so except by taking part in the final act. It is liable on principles recognized in every part of the law." 222 U. S., at 63.

The use for which the item sold in *Kalem* had been "especially" made was, of course, to display the performance that had already been recorded upon it. The producer had personally appropriated the copyright owner's protected work and, as the owner of the tangible medium of expression upon which the protected work was recorded, authorized that use by his sale of the film to jobbers. But that use of the film was not his to authorize: the copyright owner possessed the exclusive right to authorize public performances of his work. Further, the producer personally advertised the unauthorized public performances, dispelling any possible doubt as to the use of the film which he had authorized.

Respondents argue that *Kalem* stands for the proposition that supplying the "means" to accomplish an infringing activity and encouraging that activity through adverstisement are sufficient to establish liability for copyright infringement. This argument rests on a gross generalization that cannot withstand scrutiny. The producer in *Kalem* did not merely provide the "means" to accomplish an infringing activity; the producer supplied the work itself, albeit in a new medium of expression. Petitioners in the instant case do not supply Betamax consumers with respondents' works; respondents do. Petitioners supply a piece of equipment that is generally capable of copying the entire range of programs that may be televised: those that are uncopyrighted, those that are copyrighted but may be copied without objection from the copyright holder, and those that the copyright holder would prefer not to have copied. The Betamax can be used to make authorized or unauthorized uses of copyrighted works, but the range of its potential use is much broader than the particular infringing use of the film *Ben Hur* involved in *Kalem*. *Kalem* does not support respondents' novel theory of liability.

Justice Holmes stated that the producer had "contributed" to the infringement of the copyright, and the label "contributory infringement" has been applied in a number of lower court copyright cases involving an ongoing relationship between the direct infringer and the contributory infringer at the time the infringing conduct occurred. In such cases, as in other situations in which the imposition of vicarious liablity is manifestly just, the "contributory" infringer was in a position to control the use of copyrighted works by others and had authorized the use without permission from the copyright owner.[19] This case, however, plainly does not fall in that category. The only contact between Sony and the users of the Betamax that is disclosed by this record occurred at the moment of sale. The District Court expressly found that

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[19] The so-called "dance hall cases," *Famous Music Corp.* v. *Bay State Harness Horse Racing and Breeding Ass'n*, 554 F. 2d 1213 (CA1 1977) (racetrack retained infringer to supply music to paying customers); *KECA MUSIC, Inc.* v. *Dingus McGee's Co.*, 432 F. Supp. 72 (W. D. Mo. 1977) (cocktail lounge hired musicians to supply music to paying customers); *Dreamland Ball Room* v. *Shapiro, Bernstein & Co.*, 36 F. 2d 354 (CA7 1929) (dance hall hired orchestra to supply music to paying customers) are often contrasted with the so-called landlord-tenant cases, in which land-

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lords who leased premises to a direct infringer for a fixed rental and did not participate directly in any infringing activity were found not to be liable for contributory infringement. *E. g.*, *Deutsch* v. *Arnold*, 98 F. 2d 686 (CA2 1938).

In *Shapiro, Bernstein & Co.* v. *H. L. Green Co.*, 316 F. 2d 304 (CA2 1963) the owner of twenty-three chain stores retained the direct infringer to run its record departments. The relationship was structured as a licensing arrangement, so that the defendant bore none of the business risk of running the department. Instead, it received 10% or 12% of the direct infringer's gross receipts. The Court of Appeals concluded:

"[The dance-hall cases] and this one lie closer on the spectrum to the employer-employee model, than to the landlord-tenant model. On the particular facts before us, . . . Green's relationship to its infringing licensee, as well as its strong concern for the financial success of the phonograph record concession, renders it liable for the unauthorized sales of the 'bootleg' records.

"[T]he imposition of *vicarious* liability in the case before us cannot be deemed unduly harsh or unfair. Green has the power to police carefully the conduct of its concessionaire; our judgment will simply encourage it to do so, thus placing responsibility where it can and should be effectively exercised." *Id.*, at 308 (emphasis in original).

In *Gershwin Publishing Corp.* v. *Columbia Artists Management, Inc.*, 443 F. 2d 1159 (CA2 1971), the direct infringers retained the contributory infringer to manage their performances. The contributory infringer would contact each direct infringer, obtain the titles of the musical compositions to be performed, print the programs, and then sell the programs to its own local organizations for distribution at the time of the direct infringement. *Id.*, at 1161. The Court of Appeals emphasized that the contributory infringer had actual knowledge that the artists it was managing were performing copyrighted works, was in a position to police the infringing conduct of the artists, and derived substantial benefit from the actions of the primary infringers. *Id.*, at 1163.

In *Screen Gems-Columbia Music, Inc.* v. *Mark-Fi Records, Inc.*, 256 F. Supp. 399 (SDNY 1966), the direct infringer manufactured and sold bootleg records. In denying a motion for summary judgment, the District Court held that the infringer's advertising agency, the radio stations that advertised the infringer's works, and the service agency that boxed and mailed the infringing goods could all be held liable, if at trial it could be "no employee of Sony, Sonam or DDBI had either direct involvement with the allegedly infringing activity or direct contact with purchasers of Betamax who recorded copyrighted works off-the-air." 480 F. Supp., at 460. And it further found that "there was no evidence that any of the copies made by Griffiths or the other individual witnesses in this suit were influenced or encouraged by [Sony's] advertisements." *Ibid.*

If vicarious liability is to be imposed on petitioners in this case, it must rest on the fact that they have sold equipment with constructive knowledge of the fact that their customers may use that equipment to make unauthorized copies of copyrighted material. There is no precedent in the law of copyright for the imposition of vicarious liability on such a theory. The closest analogy is provided by the patent law cases to which it is appropriate to refer because of the historic kinship between patent law and copyright law.[19]

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demonstrated that they knew or should have known that they were dealing in illegal goods.

[19] *E. g., United States* v. *Paramount Pictures*, 334 U. S. 131, 158 (1948); *Fox Film Corp.* v. *Doyal*, 286 U. S. 106, 131 (1932); *Wheaton and Donaldson* v. *Peters and Grigg*, 33 U. S. 591, 657–658 (1834). The two areas of the law, naturally, are not identical twins, and we exercise the caution which we have expressed in the past in applying doctrine formulated in one area to the other. See generally, *Mazer* v. *Stein*, 347 U. S. 201, 217–218 (1954); *Bobbs-Merrill Co.* v. *Straus*, 210 U. S. 339, 345 (1908).

We have consistently rejected the proposition that a similar kinship exists between copyright law and trademark law, and in the process of doing so have recognized the basic similarities between copyrights and patents. *The Trade-Mark Cases*, 100 U. S. 82, 91–92 (1879); see also, *United Drug Co.* v. *Rectanus Co.*, 248 U. S. 90, 97 (1918)(trademark right "has little or no analogy" to copyright or patent); *McLean* v. *Fleming*, 96 U. S. 245, 254 (1877); *Canal Co.* v. *Clark*, 13 Wall. 311, 322 (1871). Given the fundamental differences between copyright law and trademark law, in this copyright case we do not look to the standard for contributory infringement set forth in *Inwood Laboratories* v. *Ives Laboratories*, 456 U. S. 844, 854–855 (1982), which was crafted for application in trademark cases. There we observed that a manufacturer or distributor could be held liable to the owner of a trademark if it intentionally induced a merchant down the chain

In the Patent Code both the concept of infringement and the concept of contributory infringement are expressly defined by statute.[20] The prohibition against contributory infringement is confined to the knowing sale of a component especially made for use in connection with a particular patent. There is no suggestion in the statute that one patentee may object to the sale of a product that might be used in connection with other patents. Moreover, the Act expressly pro-

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of distribution to pass off its product as that of the trademark owner's or if it continued to supply a product which could readily be passed off to a particular merchant whom it knew was mislabeling the product with the trademark owner's mark. If *Inwood's* narrow standard for contributory trademark infringement governed here, respondents' claim of contributory infringement would merit little discussion. Sony certainly does not "intentionally induce[ ]" its customers to make infringing uses of respondents' copyrights, nor does it supply its products to identified individuals known by it to be engaging in continuing infringement of respondents' copyrights, see *id.*, at 855.

[20] 35 U. S. C. § 271 provides:

"(a) Except as otherwise provided in this title, whoever without authority makes, uses or sells any patented invention, within the United States during the term of the patent therefor, infringes the patent.

"(b) Whoever actively induces infringement of a patent shall be liable as an infringer.

"(c) Whoever sells a component of a patented machine, manufacture, combination or composition, or a material or apparatus for use in practicing a patented process, constituting a material part of the invention, knowing the same to be especially made or especially adapted for use in an infringement of such patent, and not a staple article or commodity of commerce suitable for substantial noninfringing use, shall be liable as a contributory infringer.

"(d) No patent owner otherwise entitled to relief for infringement or contributory infringement of a patent shall be denied relief or deemed guilty of misuse or illegal extension of the patent right by reason of his having done one or more of the following: (1) derived revenue from acts which if performed by another without his consent would constitute contributory infringement of the patent; (2) licensed or authorized another to perform acts which if performed without his consent would constitute contributory infrigement of the patent; (3) sought to enforce his patent rights against infringement or contributory infringement."

vides that the sale of a "staple article or commodity of commerce suitable for substantial noninfringing use" is not contributory infringement.

When a charge of contributory infringement is predicated entirely on the sale of an article of commerce that is used by the purchaser to infringe a patent, the public interest in access to that article of commerce is necessarily implicated. A finding of contributory infringement does not, of course, remove the article from the market altogether; it does, however, give the patentee effective control over the sale of that item. Indeed, a finding of contributory infringement is normally the functional equivalent of holding that the disputed article is within the monopoly granted to the patentee.[22]

For that reason, in contributory infringement cases arising under the patent laws the Court has always recognized the critical importance of not allowing the patentee to extend his monopoly beyond the limits of his specific grant. These cases deny the patentee any right to control the distribution of unpatented articles unless they are "unsuited for any commercial noninfringing use." *Dawson Chemical Co.* v. *Rohm & Hass Co.*, 448 U. S. 176, 198 (1980). Unless a commodity "has no use except through practice of the patented method," *ibid*, the patentee has no right to claim that its distribution constitutes contributory infringment. "To form the basis for contributory infringement the item must almost be uniquely suited as a component of the patented invention." P. Rosenberg, Patent Law Fundamentals § 17.02[2] (1982). "[A] sale of an article which though adapted to an infringing use is also adapted to other and lawful uses, is not enough to make the seller a contributory infringer. Such a rule would block the wheels of commerce." *Henry* v. *A. B. Dick Co.*, 224 U. S. 1, 48 (1912), overruled on other grounds, *Motion Picture Patents Co.* v. *Universal Film Mfg. Co.*, 243 U. S. 502, 517 (1917).

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[22] It seems extraordinary to suggest that the Copyright Act confers upon all copyright owners collectively, much less the two respondents in this case, the exclusive right to distribute VTR's simply because they may be used to infringe copyrights. That, however, is the logical implication of their claim. The request for an injunction below indicates that respondents seek, in effect, to declare VTR's contraband. Their suggestion in this Court that a continuing royalty pursuant to a judicially created compulsory license would be an acceptable remedy merely indicates that respondents, for their part, would be willing to license their claimed monopoly interest in VTR's to petitioners in return for a royalty.

We recognize there are substantial differences between the patent and copyright laws. But in both areas the contributory infringement doctrine is grounded on the recognition that adequate protection of a monopoly may require the courts to look beyond actual duplication of a device or publication to the products or activities that make such duplication possible. The staple article of commerce doctrine must strike a balance between a copyright holder's legitimate demand for effective—not merely symbolic—protection of the statutory monopoly, and the rights of others freely to engage in substantially unrelated areas of commerce. Accordingly, the sale of copying equipment, like the sale of other articles of commerce, does not constitute contributory infringement if the product is widely used for legitimate, unobjectionable purposes. Indeed, it need merely be capable of substantial noninfringing uses.

IV

The question is thus whether the Betamax is capable of commercially significant noninfringing uses. In order to resolve that question, we need not explore *all* the different potential uses of the machine and determine whether or not they would constitute infringement. Rather, we need only consider whether on the basis of the facts as found by the district court a significant number of them would be non-infringing. Moreover, in order to resolve this case we need not give precise content to the question of how much use is commercially significant. For one potential use of the Betamax plainly satisfies this standard, however it is understood: private, noncommercial time-shifting in the home. It does so both (A) because respondents have no right to prevent other copyright holders from authorizing it for their programs, and (B) because the District Court's factual findings reveal that even the unauthorized home time-shifting of respondents' programs is legitimate fair use.

A. *Authorized Time Shifting*

Each of the respondents owns a large inventory of valuable copyrights, but in the total spectrum of television programming their combined market share is small. The exact percentage is not specified, but it is well below 10%.[27] If they were to prevail, the outcome of this litigation would have a significant impact on both the producers and the viewers of the remaining 90% of the programming in the Nation. No doubt, many other producers share respondents' concern about the possible consequences of unrestricted copying. Nevertheless the findings of the District Court make it clear that time-shifting may enlarge the total viewing audience and that many producers are willing to allow private time-shifting to continue, at least for an experimental time period.[28]

The District Court found:

> "Even if it were deemed that home-use recording of copyrighted material constituted infringement, the Beta-

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[27] The record suggests that Disney's programs at the time of trial consisted of approximately one hour a week of network television and one syndicated series. Universal's percentage in the Los Angeles market on commercial television stations was under 5%. See Tr. 532–533, 549–550.

[28] The District Court did not make any explicit findings with regard to how much broadcasting is wholly uncopyrighted. The record does include testimony that at least one movie—*My Man Godfrey*—falls within that category, Tr. 2300–2301, and certain broadcasts produced by the federal government are also uncopyrighted. See 17 U. S. C. § 105. Cf. *Schappner* v. *Foley*, 667 F. 2d 102 (CADC 1981) (explaining distinction between work produced by the government and work commissioned by the government). To the extent such broadcasting is now significant, it further bolsters our conclusion. Moreover, since copyright protection is not perpetual, the number of audiovisual works in the public domain necessarily increases each year.

> max could still legally be used to record noncopyrighted material or material whose owners consented to the copying. An injunction would deprive the public of the ability to use the Betamax for this noninfringing off-the-air recording.
>
> "Defendants introduced considerable testimony at trial about the potential for such copying of sports, religious, educational and other programming. This included testimony from representatives of the Offices of the Commissioners of the National Football, Basketball, Baseball and Hockey Leagues and Associations, the Executive Director of National Religious Broadcasters and various educational communications agencies. Plaintiffs attack the weight of the testimony offered and also contend that an injunction is warranted because infringing uses outweigh noninfringing uses."
>
> "Whatever the future percentage of legal versus illegal home-use recording might be, an injunction which seeks to deprive the public of the very tool or article of commerce capable of some noninfringing use would be an extremely harsh remedy, as well as one unprecedented in copyright law." 480 F. Supp., at 468.

Although the District Court made these statements in the context of considering the propriety of injunctive relief, the statements constitute a finding that the evidence concerning "sports, religious, educational, and other programming" was sufficient to establish a significant quantity of broadcasting whose copying is now authorized, and a significant potential for future authorized copying. That finding is amply supported by the record. In addition to the religious and sports officials identified explicitly by the District Court,[24] two items in the record deserve specific mention.

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[24] See Tr. 2447–2450 (Alexander Hadden, Major League Baseball); Tr. 2480, 2486–2487 (Jay Moyer, National Football League); Tr. 2515–2516 (David Stern, National Basketball Association); Tr. 2530–2534 (Gilbert Stein, National Hockey League); Tr. 2543–2552 (Thomas Hansen, National

First is the testimony of John Kenaston, the station manager of Channel 58, an educational station in Los Angeles affiliated with the Public Broadcasting Service. He explained and authenticated the station's published guide to its programs.[25] For each program, the guide tells whether unlimited home taping is authorized, home taping is authorized subject to certain restrictions (such as erasure within seven days), or home taping is not authorized at all. The Spring 1978 edition of the guide described 107 programs. Sixty-two of those programs or 58% authorize some home taping. Twenty-one of them or almost 20% authorize unrestricted home taping.[26]

Second is the testimony of Fred Rogers, president of the corporation that produces and owns the copyright on *Mr. Rogers' Neighborhood.* The program is carried by more public television stations than any other program. Its audience numbers over 3,000,000 families a day. He testified that he had absolutely no objection to home taping for noncommercial use and expressed the opinion that it is a real service to families to be able to record children's programs and to show them at appropriate times.[27]

Collegiate Athletic Association); Tr. 2565–2572 (Benjamin Armstrong, National Religious Broadcasters). Those officials were authorized to be the official spokespersons for their respective institutions in this litigation. Tr. 2432, 2479, 2509–2510, 2530, 2538, 2563. See Fed. Rules Civ. Proc. 30(b)(6).

[25] Tr. 2863–2902; Def. Exh. PI.

[26] See also Tr. 2833–2844 (similar testimony by executive director of New Jersey Public Broadcasting Authority). Cf. Tr. 2592–2605 (testimony by chief of New York Education Department's Bureau of Mass Communications approving home taping for educational purposes).

[27] "Some public stations, as well as commercial stations, program the 'Neighborhood' at hours when some children cannot use it. I think that it's a real service to families to be able to record such programs and show them at appropriate times. I have always felt that with the advent of all of this new technology that allows people to tape the 'Neighborhood' off-the-air, and I'm speaking for the 'Neighborhood' because that's what I produce, that they then become much more active in the programming of

If there are millions of owners of VTR's who make copies of televised sports events, religious broadcasts, and educational programs such as *Mister Rogers' Neighborhood*, and if the proprietors of those programs welcome the practice, the business of supplying the equipment that makes such copying feasible should not be stifled simply because the equipment is used by some individuals to make unauthorized reproductions of respondents' works. The respondents do not represent a class composed of all copyright holders. Yet a finding of contributory infringement would inevitably frustrate the interests of broadcasters in reaching the portion of their audience that is available only through time-shifting.

Of course, the fact that other copyright holders may welcome the practice of time-shifting does not mean that respondents should be deemed to have granted a license to copy their programs. Third party conduct would be wholly irrelevant in an action for direct infringement of respondents' copyrights. But in an action for *contributory* infringement against the seller of copying equipment, the copyright holder may not prevail unless the relief that he seeks affects only his programs, or unless he speaks for virtually all copyright holders with an interest in the outcome. In this case, the record makes it perfectly clear that there are many important producers of national and local television programs who find nothing objectionable about the enlargement in the size of the television audience that results from the practice of time-shifting for private home use.[28] The seller of the equipment

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their family's television life. Very frankly, I am opposed to people being programmed by others. My whole approach in broadcasting has always been 'You are an important person just the way you are. You can make healthy decisions.' Maybe I'm going on too long, but I just feel that anything that allows a person to be more active in the control of his or her life, in a healthy way, is important." T. R. 2920-2921. See also Def. Exh. PI, p. 85.

[28] It may be rare for large numbers of copyright owners to authorize duplication of their works without demanding a fee from the copier. In the context of public broadcasting, however, the user of the copyrighted

that expands those producers' audiences cannot be a contributory infringer if, as is true in this case, it has had no direct involvement with any infringing activity.

B. *Unauthorized Time-Shifting*

Even unauthorized uses of a copyrighted work are not necessarily infringing. An unlicensed use of the copyright is not an infringement unless it conflicts with one of the specific exclusive rights conferred by the copyright statute. *Twentieth Century Music Corp.* v. *Aiken,* 422 U. S. 151, 154–155. Moreover, the definition of exclusive rights in § 106 of the present Act is prefaced by the words "subject to sections 107 through 118." Those sections describe a variety of uses of copyrighted material that "are not infringements of copyright

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work is not required to pay a fee for access to the underlying work. The traditional method by which copyright owners capitalize upon the television medium—commercially sponsored free public broadcast over the public airwaves—is predicated upon the assumption that compensation for the value of displaying the works will be received in the form of advertising revenues.

In the context of television programming, some producers evidently believe that permitting home viewers to make copies of their works off the air actually enhances the value of their copyrights. Irrespective of their reasons for authorizing the practice, they do so, and in significant enough numbers to create a substantial market for a non-infringing use of the Sony VTR's. No one could dispute the legitimacy of that market if the producers had authorized home taping of their programs in exchange for a license fee paid directly by the home user. The legitimacy of that market is not compromised simply because these producers have authorized home taping of their programs without demanding a fee from the home user. The copyright law does not require a copyright owner to charge a fee for the use of his works, and as this record clearly demonstrates, the owner of a copyright may well have economic or noneconomic reasons for permitting certain kinds of copying to occur without receiving direct compensation from the copier. It is not the role of the courts to tell copyright holders the best way for them to exploit their copyrights: even if respondents' competitors were ill-advised in authorizing home videotaping, that would not change the fact that they have created a substantial market for a paradigmatic non-infringing use of petitioners' product.

notwithstanding the provisions of § 106." The most pertinent in this case is § 107, the legislative endorsement of the doctrine of "fair use."[29]

That section identifies various factors[30] that enable a Court to apply an "equitable rule of reason" analysis to particular claims of infringement.[31] Although not conclusive, the first factor requires that "the commercial or nonprofit character of an activity" be weighed in any fair use decision.[32] If the Betamax were used to make copies for a commercial or profit-making purpose, such use would presumptively be unfair. The contrary presumption is appropriate here, however, because the District Court's findings plainly establish that time-shifting for private home use must be characterized as a noncommercial, nonprofit activity. Moreover, when one considers the nature of a televised copyrighted audiovisual work, see 17 U. S. C. § 107(2), and that timeshifting merely enables a viewer to see such a work which he had been in-

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[29] The Copyright Act of 1909, 35 Stat. 1075, did not have a "fair use" provision. Although that Act's compendium of exclusive rights "to print, reprint, publish, copy, and vend the copyrighted work" was broad enough to encompass virtually all potential interactions with a copyrighted work, the statute was never so construed. The courts simply refused to read the statute literally in every situation. When Congress amended the statute in 1976, it indicated that it "intended to restate the present judicial doctrine of fair use, not to change, narrow, or enlarge it in any way." House Report No. 94-1476, 94th Cong., 2d Sess., p. 66.

[30] Section 107 provides:

"Notwithstanding the provisions of section 106, the fair use of a copyrighted work, including such use by reproduction in copies or phonorecords or by any other means specified by that section, for purposes such as criticism, comment, news reporting, teaching (including multiple copies for classroom use), scholarship, or research, is not an infringement of copyright. In determining whether the use made of a work in any particular case is a fair use the factors to be considered shall include-

"(1) the purpose and character of the use, including whether such use is of a commercial nature or is for nonprofit educational purposes;

"(2) the nature of the copyrighted work;

"(3) the amount and substantiality of the portion used in relation to the copyrighted work as a whole; and

"(4) the effect of the use upon the potential market for or value of the copyrighted work." 17 U. S. C. § 107.

[31] The House Report expressly stated that the fair use doctrine is an "equitable reason of reason" in its explanation of the fair use section:

"Although the courts have considered and ruled upon the fair use doctrine over and over again, no real definition of the concept has ever emerged. Indeed, since the doctrine is an equitable rule of reason, no generally applicable definition is possible, and each case raising the question must be decided on its own facts. . . .

General intention behind the provision

"The statement of the fair use doctrine in section 107 offers some guidance to users in determining when the principles of the doctrine apply.

However, the endless variety of situations and combinations of circumstances that can rise in particular cases precludes the formulation of exact rules in the statute. The bill endorses the purpose and general scope of the judicial doctrine of fair use, but there is no disposition to freeze the doctrine in the statute, especially during a period of rapid technological change. Beyond a very broad statutory explanation of what fair use is and some of the criteria applicable to it, the courts must be free to adapt the doctrine to particular situations on a case-by-case basis." H. Rep. No. 94-1476, pp. 65-66.

The Senate Committee similarly eschewed a rigid, bright line approach to fair use. The Senate Report endorsed the view "that off-the-air recording for convenience" could be considered "fair use" under some circumstances, although it then made it clear that it did not intend to suggest that off-the-air recording for convenience should be deemed fair use under any circumstances imaginable. Senate Report 94-473, pp. 65-66. The latter qualifying statement is quoted by the dissent, *post*, at 25, and if read in isolation, would indicate that the Committee intended to condemn all off-the-air recording for convenience. Read in context, however, it is quite clear that that was the farthest thing from the Committee's intention.

[32] "The Committee has amended the first of the criteria to be considered—'the purpose and character of the use'—to state explicitly that this factor includes a consideration of 'whether such use is of a commercial nature or is for non-profit educational purposes.' This amendment is not intended to be interpreted as any sort of not-for-profit limitation on educational uses of copyrighted works. It is an express recognition that, as under the present law, the commercial or non-profit character of an activity, while not conclusive with respect to fair use, can and should be weighed along with other factors in fair use decisions." H. Rep. No. 94-1476, p. 66.

vited to witness in its entirety free of charge, the fact that the entire work is reproduced, see *id.*, at § 107(3), does not have its ordinary effect of militating against a finding of fair use.[33]

This is not, however, the end of the inquiry because Congress has also directed us to consider "the effect of the use upon the potential market for or value of the copyrighted work." *Id.*, at § 107(4). The purpose of copyright is to create incentives for creative effort. Even copying for noncommercial purposes may impair the copyright holder's ability to obtain the rewards that Congress intended him to have. But a use that has no demonstrable effect upon the potential market for, or the value of, the copyrighted work need not be prohibited in order to protect the author's incentive to create. The prohibition of such noncommercial uses would merely inhibit access to ideas without any countervailing benefit.[34]

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[33] It has been suggested that "consumptive uses of copyrights by home VTR users are commercial even if the consumer does not sell the homemade tape because the consumer will not buy tapes separately sold by the copyrightholder." Home Recording of Copyrighted Works: Hearing before Subcommittee on Courts, Civil Liberties and the Adminstration of Justice of the House Committee on the Judiciary, 97th Congress, 2d Session, pt. 2, p. 1250 (1982) (memorandum of Prof. Laurence H. Tribe). Furthermore, "[t]he error in excusing such theft as noncommerical," we are told, "can be seen by simple analogy: jewel theft is not converted into a noncommercial veniality if stolen jewels are simply worn rather than sold." *Ibid.* The premise and the analogy are indeed simple, but they add nothing to the argument. The use to which stolen jewlery is put is quite irrelevant in determining whether depriving its true owner of his present possessory interest in it is venial; because of the nature of the item and the true owner's interests in physical possession of it, the law finds the taking objectionable even if the thief does not use the item at all. Theft of a particular item of personal property of course may have commercial significance, for the thief deprives the owner of his right to sell that particular item to any individual. Timeshifting does not even remotely entail comparable consequences to the copyright owner. Moreover, the timeshifter no more steals the program by watching it once than does the live viewer, and the live viewer is no more likely to buy pre-recorded videotapes than is the timeshifter. Indeed, no live viewer would buy a pre-recorded videotape if he did not have access to a VTR.

Thus, although every commercial use of copyrighted material is presumptively an unfair exploitation of the monopoly privilege that belongs to the owner of the copyright, noncommercial uses are a different matter. A challenge to a noncommercial use of a copyrighted work requires proof either that the particular use is harmful, or that if it should become widespread, it would adversely affect the potential market for the copyrighted work. Actual present harm need not be shown; such a requirement would leave the copyright holder with no defense against predictable damage. Nor is it necessary to show with certainty that future harm will result. What is necessary is a showing by a preponderance of the evidence that *some* meaningful likelihood of future harm exists. If the intended use is for commercial gain, that likelihood may be presumed. But if it is for a noncommercial purpose, the likelihood must be demonstrated.

In this case, respondents failed to carry their burden with regard to home time-shifting. The District Court described respondents' evidence as follows:

> "Plaintiffs' experts admitted at several points in the trial that the time-shifting without librarying would result in 'not a great deal of harm.' Plaintiffs' greatest concern about time-shifting is with 'a point of important philosophy that transcends even commercial judgment.' They fear that with any Betamax usage, 'invisible boundaries' are passed: 'the copyright owner has lost control over his program.'" 480 F. Supp., at 467.

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[34] Cf. Latman, Fair Use of Copyrighted Works (1958), reprinted as Study No. 14 in Senate Judiciary Committee, Copyright Law Revision, Studies Prepared for the Subcommittee on Patents, Trademarks, and Copyrights, 86th Cong., 2d Sess., p. 30 (1960):

"In certain situations, the copyright owner suffers no substantial harm from the use of the work. . . . Here again, is the partial marriage between the doctrine of fair use and the legal maxim *de minimis non curat lex.*"

Later in its opinion, the District Court observed:

> "Most of plaintiffs' predictions of harm hinge on speculation about audience viewing patterns and ratings, a measurement system which Sidney Sheinberg, MCA's president, calls a 'black art' because of the significant level of imprecision involved in the calculations." *Id.*, at 469.[35]

There was no need for the District Court to say much about past harm. "Plaintiffs have admitted that no actual harm to their copyrights has occurred to date." *Id.*, at 451.

On the question of potential future harm from time-shifting, the District Court offered a more detailed analysis of the evidence. It rejected respondents' "fear that persons 'watching' the original telecast of a program will not be measured in the live audience and the ratings and revenues will decrease," by observing that current measurement technology allows the Betamax audience to be reflected. *Id.*, at 466.[36] It rejected respondents' prediction "that live televi-

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[35] See also 480 F. Supp., at 451:

"It should be noted, however, that plaintiffs' argument is more complicated and speculative than was the plaintiff's in *Williams & Wilkins*. . . . Here, plaintiffs ask the court to find harm based on many more assumptions. . . . As is discussed more fully in Part IV, *infra*, some of these assumptions are based on neither fact nor experience, and plaintiffs admit that they are to some extent inconsistent and illogical."

[36] "There was testimony at trial, however, that Nielsen Ratings has already developed the ability to measure when a Betamax in a sample home is recording the program. Thus, the Betamax will be measured as a part of the live audience. The later diary can augment that measurement with information about subsequent viewing." 480 F. Supp., at 466.

In a separate section, the District Court rejected plaintiffs' suggestion that the commercial attractiveness of television broadcasts would be diminished because Betamax owners would use the pause button or fast-forward control to avoid viewing advertisements:

"It must be remembered, however, that to omit commercials, Betamax owners must view the program, including the commercials, while recording. To avoid commercials during playback, the viewer must fast-forward and, for the most part, guess as to when the commercial has passed. For sion or movie audiences will decrease as more people watch Betamax tapes as an alternative," with the observation that "[t]here is no factual basis for [the underlying] assumption." *Ibid.*[27] It rejected respondents' "fear that time-shifting will reduce audiences for telecast reruns," and concluded instead that "given current market practices, this should aid plaintiffs rather than harm them." *Ibid.*[28] And it declared that respondents' suggestion "that theater or film rental exhibition of a program will suffer because of time-shift recording of that program" "lacks merit." 480 F. Supp., at 467.[29]

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most recordings, either practice may be too tedious. As defendants' survey showed, 92% of the programs were recorded with commercials and only 25% of the owners fast-forward through them. Advertisers will have to make the same kinds of judgments they do now about whether persons viewing televised programs actually watch the advertisements which interrupt them." *Id.*, at 468.

[27] "Here plaintiffs assume that people will view copies when they would otherwise be watching television or going to the movie theater. There is no factual basis for this assumption. It seems equally likely that Betamax owners will play their tapes when there is nothing on television they wish to see and no movie they want to attend. Defendants' survey does not show any negative effect of Betamax ownership on television viewing or theater attendance." *Ibid.*

[28] "The underlying assumptions here are particularly difficult to accept. Plaintiffs explain that the Betamax increases access to the original televised material and that the more people there are in this original audience, the fewer people the rerun will attract. Yet current marketing practices, including the success of syndication, show just the opposite. Today, the larger the audience for the original telecast, the higher the price plaintiffs can demand from broadcasters from rerun rights. There is no survey within the knowledge of this court to show that the rerun audience is comprised of persons who have not seen the program. In any event, if ratings can reflect Betamax recording, original audiences may increase and, given market practices, this should aid plaintiffs rather than harm them." *Ibid.*

[29] "This suggestion lacks merit. By definition, time-shift recording entails viewing and erasing, so the program will no longer be on tape when the later theater run begins. Of course, plaintiffs may fear that the Betamax will keep the tapes long enough to satisfy all their interest in the program and will, therefore, not patronize later theater exhibitions. To the extent this practice involves librarying, it is addressed in section V. C.,

After completing that review, the District Court restated its overall conclusion several times, in several different ways. "Harm from time-shifting is speculative and, at best, minimal." *Ibid.* "The audience benefits from the time-shifting capability have already been discussed. It is not implausible that benefits could also accrue to plaintiffs, broadcasters, and advertisers, as the Betamax makes it possible for more persons to view their broadcasts." *Ibid.* "No likelihood of harm was shown at trial, and plaintiffs admitted that there had been no actual harm to date." *Id.*, at 468–469. "Testimony at trial suggested that Betamax may require adjustments in marketing strategy, but it did not establish even a likelihood of harm." *Id.*, at 469. "Television production by plaintiffs today is more profitable than it has ever been, and, in five weeks of trial, there was no concrete evidence to suggest that the Betamax will change the studios' financial picture." *Ibid.*

The District Court's conclusions are buttressed by the fact that to the extent time-shifting expands public access to freely broadcast television programs, it yields societal benefits. Earlier this year, in *Community Television of Southern California* v. *Gottfried*, —— U. S. ——, —— - ——, n. 12 (1983), we acknowledged the public interest in making television broadcasting more available. Concededly, that interest is not unlimited. But it supports an interpretation of the concept of "fair use" that requires the copyright holder to demonstrate some likelihood of harm before he may condemn a private act of time-shifting as a violation of federal law.

When these factors are all weighed in the "equitable rule of reason" balance, we must conclude that this record amply supports the District Court's conclusion that home time-shifting is fair use. In light of the findings of the District Court

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infra. It should also be noted that there is no evidence to suggest that the public interest in later theatrical exhibitions of motion pictures will be reduced any more by Betamax recording than it already is by the television broadcast of the film." 480 F. Supp., at 467.

regarding the state of the empirical data, it is clear that the Court of Appeals erred in holding that the statute as presently written bars such conduct.[40]

In summary, the record and findings of the District Court lead us to two conclusions. First, Sony demonstrated a significant likelihood that substantial numbers of copyright hold-

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[40] The Court of Appeals chose not to engage in any "equitable rule of reason" analysis in this case. Instead, it assumed that the category of "fair use" is rigidly circumscribed by a requirement that every such use must be "productive." It therefore concluded that copying a television program merely to enable the viewer to receive information or entertainment that he would otherwise miss because of a personal scheduling conflict could never be fair use. That understanding of "fair use" was erroneous.

Congress has plainly instructed us that fair use analysis calls for a sensitive balancing of interests. The distinction between "productive" and "unproductive" uses may be helpful in calibrating the balance, but it cannot be wholly determinative. Although copying to promote a scholarly endeavor certainly has a stronger claim to fair use than copying to avoid interrupting a poker game, the question is not simply two-dimensional. For one thing, it is not true that all copyrights are fungible. Some copyrights govern material with broad potential secondary markets. Such material may well have a broader claim to protection because of the greater potential for commercial harm. Copying a news broadcast may have a stronger claim to fair use than copying a motion picture. And, of course, not all uses are fungible. Copying for commercial gain has a much weaker claim to fair use than copying for personal enrichment. But the notion of social "productivity" cannot be a complete answer to this analysis. A teacher who copies to prepare lecture notes is clearly productive. But so is a teacher who copies for the sake of broadening his personal understanding of his specialty. Or a legislator who copies for the sake of broadening her understanding of what her constituents are watching; or a constituent who copies a news program to help make a decision on how to vote.

Making a copy of a copyrighted work for the convenience of a blind person is expressly identified by the House Committee Report as an example of fair use, with no suggestion that anything more than a purpose to entertain or to inform need motivate the copying. In a hospital setting, using a VTR to enable a patient to see programs he would otherwise miss has no productive purpose other than contributing to the psychological well-being of the patient. Virtually any time-shifting that increases viewer access to television programming may result in a comparable benefit. The statutory language does not identify any dicohotomy between productive and ers who license their works for broadcast on free television would not object to having their broadcasts time-shifted by private viewers. And second, respondents failed to demonstrate that time-shifting would cause any likelihood of nonminimal harm to the potential market for, or the value of, their copyrighted works. The Betamax is, therefore, capable of substantial noninfringing uses. Sony's sale of such equipment to the general public does not constitute contributory infringement of respondent's copyrights.

V

> "The direction of Art. I is that *Congress* shall have the power to promote the progress of science and the useful arts. When, as here, the Constitution is permissive, the sign of how far Congress has chosen to go can come only from Congress." *Deepsouth Packing Co.* v. *Laitram Corp.*, 406 U. S. 518, 530 (1972).

One may search the Copyright Act in vain for any sign that the elected representatives of the millions of people who watch television every day have made it unlawful to copy a program for later viewing at home, or have enacted a flat prohibition against the sale of machines that make such copying possible.

It may well be that Congress will take a fresh look at this new technology, just as it so often has examined other innovations in the past. But it is not our job to apply laws that have not yet been written. Applying the copyright statute, as it now reads, to the facts as they have been developed in this case, the judgment of the Court of Appeals must be reversed.

It is so ordered.

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nonproductive time-shifting, but does require consideration of the economic consequences of copying.

SUPREME COURT OF THE UNITED STATES

No. 81-1687

SONY CORPORATION OF AMERICA, ET AL., PETITIONERS *v.* UNIVERSAL CITY STUDIOS, INC., ET AL.

ON WRIT OF CERTIORARI TO THE UNITED STATES COURT OF APPEALS FOR THE NINTH CIRCUIT

[January 17, 1984]

JUSTICE BLACKMUN, with whom JUSTICE MARSHALL, JUSTICE POWELL, and JUSTICE REHNQUIST join, dissenting.

A restatement of the facts and judicial history of this case is necessary, in my view, for a proper focus upon the issues. Respondents' position is hardly so "unprecedented," *ante*, at 2, in the copyright law, nor does it really embody a "gross generalization," *ante*, at 17, or a "novel theory of liability," *ante*, at 18, and the like, as the Court, in belittling their claims, describes the efforts of respondents.

I

The introduction of the home videotape recorder (VTR) upon the market has enabled millions of Americans to make recordings of television programs in their homes, for future and repeated viewing at their own convenience. While this practice has proved highly popular with owners of television sets and VTRs, it understandably has been a matter of concern for the holders of copyrights in the recorded programs. A result is the present litigation, raising the issues whether the home recording of a copyrighted television program is an infringement of the copyright, and, if so, whether the manufacturers and distributors of VTRs are liable as contributory infringers. I would hope that these questions ultimately will be considered seriously and in depth by the Congress and be resolved there, despite the fact that the Court's decision today provides little incentive for congressional action. Our task in the meantime, however, is to resolve these issues as best we can in the light of ill-fitting existing copyright law.

It is no answer, of course, to say and stress, as the Court does, this Court's "consistent deference to Congress" whenever "major technological innovations" appear. *Ante*, at 12. Perhaps a better and more accurate description is that the Court has tended to evade the hard issues when they arise in the area of copyright law. I see no reason for the Court to be particularly pleased with this tradition or to continue it. Indeed, it is fairly clear from the legislative history of the 1976 Act that Congress meant to change the old pattern and enact a statute that would cover new technologies, as well as old.

II

In 1976, respondents Universal City Studios, Inc., and Walt Disney Productions (Studios) brought this copyright infringement action in the United States District Court for the Central District of California against, among others, petitioners Sony Corporation, a Japanese corporation, and Sony Corporation of America, a New York corporation, the manufacturer and distributor, respectively, of the Betamax VTR. The Studios sought damages, profits, and a wide-ranging injunction against further sales or use of the Betamax or Betamax tapes.

The Betamax, like other VTRs, presently is capable of recording television broadcasts off the air on videotape cassettes, and playing them back at a later time.[1] *Two* kinds of

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[1] The Betamax has three primary components: a tuner that receives television ("RF") signals broadcast over the airwaves; an adapter that converts the RF signals into audio-video signals; and a recorder that places the audio-video signals on magnetic tape. Sony also manufactures VTRs without built-in tuners; these are capable of playing back prerecorded tapes and recording home movies on videotape, but cannot record off the air. Since the Betamax has its own tuner, it can be used to record off one channel while another channel is being watched.

Betamax usage are at issue here.[2] The first is "time-shifting," whereby the user records a program in order to watch it at a later time, and then records over it, and thereby erases the program, after a single viewing. The second is "library-building," in which the user records a program in order to keep it for repeated viewing over a longer term. Sony's advertisements, at various times, have suggested that Betamax users "record favorite shows" or "build a library." Sony's Betamax advertising has never contained warnings about copyright infringement, although a warning does appear in the Betamax operating instructions.

The Studios produce copyrighted "movies" and other works that they release to theaters and license for television broadcast. They also rent and sell their works on film and on prerecorded videotapes and videodiscs. License fees for television broadcasts are set according to audience ratings, compiled by rating services that do not measure any playbacks of videotapes. The Studios make the serious claim that VTR recording may result in a decrease in their revenue from licensing their works to television and from marketing them in other ways.

After a 5-week trial, the District Court, with a detailed opinion, ruled that home VTR recording did not infringe the Studios' copyrights under either the Act of March 4, 1909 (1909 Act), 35 Stat. 1075, as amended (formerly codified as 17 U. S. C. § 1 *et seq.* (1976 ed.)), or the Copyright Revision Act of 1976 (1976 Act), 90 Stat. 2541, 17 U. S. C. § 101 *et seq.*

The Betamax is available with auxiliary features, including a timer, a pause control, and a fast-forward control; these allow Betamax owners to record programs without being present, to avoid (if they are present) recording commercial messages, and to skip over commercials while playing back the recording. Videotape is reusable; the user erases its record by recording over it.

[2] This case involves only the home recording for home use of television programs broadcast free over the airwaves. No issue is raised concerning cable or pay television, or the sharing or trading of tapes.

(1982 ed.).[3] The District Court also held that even if home VTR recording were an infringement, Sony could not be held liable under theories of direct infringement, contributory infringement, or vicarious liability. Finally, the court concluded that an injunction against sales of the Betamax would be inappropriate even if Sony were liable under one or more of those theories. 480 F. Supp. 429 (1979).

The United States Court of Appeals for the Ninth Circuit reversed in virtually every respect. 659 F. 2d 963 (1981). It held that the 1909 Act and the 1976 Act contained no implied exemption for "home use" recording, that such recording was not "fair use," and that the use of the Betamax to record the Studios' copyrighted works infringed their copyrights. The Court of Appeals also held Sony liable for contributory infringement, reasoning that Sony knew and anticipated that the Betamax would be used to record copyrighted material off the air, and that Sony, indeed, had induced, caused, or materially contributed to the infringing conduct. The Court of Appeals remanded the case to the District Court for appropriate relief; it suggested that the District Court could consider the award of damages or a continuing royalty in lieu of an injunction. *Id.*, at 976.

III

The Copyright Clause of the Constitution, Art. I, § 8, cl. 8, empowers Congress "To promote the Progress of Science and useful Arts, by securing for limited Times to Authors and Inventors the exclusive Right to their respective Writings and Discoveries." This Nation's initial copyright statute was passed by the First Congress. Entitled "An Act for the encouragement of learning," it gave an author "the sole right and liberty of printing, reprinting, publishing and vending" his "map, chart, book or books" for a period of 14 years. Act of May 31, 1790, § 1, 1 Stat. 124. Since then, as the technology available to authors for creating and preserving their writings has changed, the governing statute has changed with it. By many amendments, and by complete revisions in 1831, 1870, 1909, and 1976,[4] authors' rights have been expanded to provide protection to any "original works of authorship fixed in any tangible medium of expression," including "motion pictures and other audiovisual works." 17 U. S. C. § 102(a).[5]

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[3] At the trial, the Studios proved 32 individual instances where their copyrighted works were recorded on Betamax VTRs. Two of these instances occurred after January 1, 1978, the primary effective date of the 1976 Act; all the others occurred while the 1909 Act was still effective. My analysis focuses primarily on the 1976 Act, but the principles governing copyright protection for these works are the same under either Act.

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[4] Act of Feb. 3, 1831, ch. 16, 4 Stat. 436; Act of July 8, 1870, §§ 85–111, 16 Stat. 212–217; Act of Mar. 4, 1909, 35 Stat. 1075 (formerly codified as 17 U. S. C. § 1 *et seq.* (1976 ed.)); Copyright Revision Act of 1976, 90 Stat. 2541 (codified as 17 U. S. C. § 101 *et seq.* (1982 ed.).

[5] Section 102(a) provides:

"Copyright protection subsists, in accordance with this title, in original works of authorship fixed in any tangible medium of expression, now known or later developed, from which they can be perceived, reproduced, or otherwise communicated, either directly or with the aid of a machine or device. Works of authorship include the following categories:

"(1) literary works;
"(2) musical works, including any accompanying words;
"(3) dramatic works, including any accompanying music;
"(4) pantomimes and choreographic works;
"(5) pictorial, graphic, and sculptural works;
"(6) motion pictures and other audiovisual works; and
"(7) sound recordings."

Definitions of terms used in § 102(a)(6) are provided by § 101: "Audiovisual works" are "works that consist of a series of related images which are intrinsically intended to be shown by the use of machines, or devices such as projectors, viewers, or electronic equipment, together with accompanying sounds, if any, regardless of the nature of the material objects, such as films or tapes, in which the works are embodied." And "motion pictures" are "audiovisual works consisting of a series of related images which, when shown in succession, impart an impression of motion, together with accompanying sounds, if any." Most commercial television programs, if fixed on film or tape at the time of broadcast or before, qualify as "audiovisual works." Since the categories set forth in § 102(a) are not

Section 106 of the 1976 Act grants the owner of a copyright a variety of exclusive rights in the copyrighted work,[6] including the right "to reproduce the copyrighted work in copies or phonorecords."[7] This grant expressly is made subject to §§ 107–118, which create a number of exemptions and limitations on the copyright owner's rights. The most important of these sections, for present purposes, is § 107; that section states that "the fair use of a copyrighted work . . . is not an infringement of copyright."[8]

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mutually exclusive, a particular television program may also qualify for protection as a dramatic, musical, or other type of work.

[6] Section 106 provides:

"Subject to sections 107 through 118, the owner of copyright under this title has the exclusive rights to do and to authorize any of the following:

"(1) to reproduce the copyrighted work in copies or phonorecords;

"(2) to prepare derivative works based upon the copyrighted work;

"(3) to distribute copies or phonorecords of the copyrighted work to the public by sale or other transfer of ownership, or by rental, lease, or lending;

"(4) in the case of literary, musical, dramatic, and choreographic works, pantomimes, and motion pictures and other audiovisual works, to perform the copyrighted work publicly; and

"(5) in the case of literary, musical, dramatic, and choreographic works, pantomimes, and pictorial, graphic, or sculptural works, including the individual images of a motion picture or other audiovisual work, to display the copyrighted work publicly."

[7] A "phonorecord" is defined by § 101 as a reproduction of sounds other than sounds accompanying an audiovisual work, while a "copy" is a reproduction of a work in any form other than a phonorecord.

[8] Section 107 provides:

"Notwithstanding the provisions of section 106, the fair use of a copyrighted work, including such use by reproduction in copies or phonorecords or by any other means specified by that section, for purposes such as criticism, comment, news reporting, teaching (including multiple copies for classroom use), scholarship, or research, is not an infringement of copyright. In determining whether the use made of a work in any particular case is a fair use the factors to be considered shall include—

"(1) the purpose and character of the use, including whether such use is of a commercial nature or is for nonprofit educational purposes;

"(2) the nature of the copyrighted work;

The 1976 Act, like its predecessors,[9] does *not* give the copyright owner full and complete control over all possible uses of his work. If the work is put to some use not enumerated in § 106, the use is not an infringement. See *Fortnightly Corp.* v. *United Artists*, 392 U. S. 390, 393–395 (1968). Thus, before considering whether home videotaping comes within the scope of the fair use exemption, one first must inquire whether the practice appears to violate the exclusive right, granted in the first instance by § 106(1), "to reproduce the copyrighted work in copies or phonorecords."

"(3) the amount and substantiality of the portion used in relation to the copyrighted work as a whole; and

"(4) the effect of the use upon the potential market for or value of the copyrighted work."

Section 101 makes it clear that the four factors listed in this section are "illustrative and not limitative."

[9] The 1976 Act was the product of a revision effort lasting more than 20 years. Spurred by the recognition that "significant developments in technology and communications" had rendered the 1909 Act inadequate, S. Rep. No. 94–473, p. 47 (1975); see H. R. Rep. No. 94–1476, p. 47 (1976), Congress in 1955 authorized the Copyright Office to prepare a series of studies on all aspects of the existing copyright law. Thirty-four studies were prepared and presented to Congress. The Register of Copyrights drafted a comprehensive report with recommendations, House Committee on the Judiciary, Copyright Law Revision, Report of the Register of Copyrights on the General Revision of the U. S. Copyright Law, 87th Cong., 1st Sess. (Comm. Print 1961) (Register's 1961 Report), and general revision bills were introduced near the end of the 88th Congress in 1964. H. R. 11947/S. 3008, 88th Cong., 2d Sess. (1964). The Register issued a second report in 1965, with revised recommendations. House Committee on the Judiciary, Copyright Law Revision, Pt. 6, Supplementary Report of the Register of Copyrights on the General Revision of the U. S. Copyright Law: 1965 Revision Bill, 89th Cong., 1st Sess. (Comm. Print 1965) (Register's Supplementary Report). Action on copyright revision was delayed from 1967 to 1974 by a dispute on cable television, see generally Second Supplementary Report of the Register of Copyrights on the General Revision of the U. S. Copyright Law: 1975 Revision Bill, ch. V, pp. 2–26 (Draft Oct.-Dec. 1975) (Register's Second Supplementary Report), but a compromise led to passage of the present Act in 1976.

A

Although the word "copies" is in the plural in § 106(1), there can be no question that under the Act the making of even a single unauthorized copy is prohibited. The Senate and House Reports explain: "The references to 'copies or phonorecords,' although in the plural, are intended here and throughout the bill to include the singular (1 U. S. C. § 1)."[10] S. Rep. No. 94-473, p. 58 (1975) (1975 Senate Report); H. R. Rep. No. 94-1476, p. 61 (1976) (1976 House Report). The Reports then describe the reproduction right established by § 106(1):

> "[T]he right 'to reproduce the copyrighted work in copies or phonorecords' means the right to produce a material object in which the work is duplicated, transcribed, imitated, or simulated in a fixed form from which it can be 'perceived, reproduced, or otherwise communicated, either directly or with the aid of a machine or device.' As under the present law, a copyrighted work would be infringed by reproducing it in whole or in any substantial part, and by duplicating it exactly or by imitation or simulation." 1975 Senate Report 58; 1976 House Report 61.

The making of even a single videotape recording at home falls within this definition; the VTR user produces a material object from which the copyrighted work later can be perceived. Unless Congress intended a special exemption for the making of a single copy for personal use, I must conclude that VTR recording is contrary to the exclusive rights granted by § 106(1).

The 1976 Act and its accompanying reports specify in some detail the situations in which a single copy of a copyrighted work may be made without infringement concerns. Section 108(a), for example, permits a library or archives "to reproduce no more than one copy or phonorecord of a work" for a patron, but only under very limited conditions; an entire work, moreover, can be copied only if it cannot be obtained elsewhere at a fair price.[11] § 108(e); see also § 112(a) (broadcaster may "make no more than one copy or phonorecord of a particular transmission program," and only under certain conditions). In other respects, the making of single copies is permissible only within the limited confines of the fair use doctrine. The Senate report, in a section headed "Single and multiple copying," notes that the fair use doctrine would permit a teacher to make a single copy of a work for use in the classroom, but only if the work was not a "sizable" one such as a novel or treatise. 1975 Senate Report 63–64; accord, 1976 House Report 68–69, 71. Other situations in which the making of a single copy would be fair use are described in the House and Senate reports.[12] But neither the statute nor its legislative history suggests any intent to create a general exemption for a single copy made for personal or private use.

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[10] 1 U. S. C. § 1 provides in relevant part:

"In determining the meaning of any Act of Congress, unless the context indicates otherwise . . . words importing the plural include the singular. . . ."

Indeed, it appears that Congress considered and rejected the very possibility of a special private use exemption. The issue was raised early in the revision process, in one of the studies prepared for Congress under the supervision of the Copyright Office. Latman, Fair Use of Copyrighted Works (1958), reprinted in Senate Committee on the Judiciary, Copyright Law Revision, Studies Prepared for the Subcommittee on Patents, Trademarks, and Copyrights, 86th Cong., 2d Sess., 1 (1960) (Latman Fair Use Study). This study found no reported case supporting the existence of an exemption for private use, although it noted that "the purpose and nature of a private use, and in some cases the small amount taken, might lead a court to apply the general principles of fair use in such a way as to deny liability." *Id.*, at 12. After reviewing a number of foreign copyright laws that contained explicit statutory exemptions for private or personal use, *id.*, at 25, Professor Latman outlined several approaches that a revision bill could take to the general issue of exemptions and fair use. One of these was the adoption of particularized rules to cover specific situations, including "the field of personal use." *Id.*, at 33.[13]

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[11] The library photocopying provisions of § 108 do not excuse any person who requests "a copy" from a library if the requester's use exceeds fair use. § 108(f)(2). Moreover, a library is absolved from liability for the unsupervised use of its copying equipment provided that the equipment bears a notice informing users that "the making of a copy" may violate the copyright law. § 108(f)(1).

[12] For example, "the making of a single copy or phonorecord by an individual as a free service for a blind person" would be a fair use, as would "a single copy reproduction of an excerpt from a copyrighted work by a calligrapher for a single client" or "a single reproduction of excerpts from a copyrighted work by a student calligrapher or teacher in a learning situation." 1975 Senate Report 66–67; see 1976 House Report 73–74. Application of the fair use doctrine in these situations, of course, would be unnecessary if the 1976 Act created a general exemption for the making of a single copy.

Rejecting the latter alternative, the Register of Copyrights recommended that the revised copyright statute simply mention the doctrine of fair use and indicate its general scope. The Register opposed the adoption of rules and exemptions to cover specific situations,[14] preferring, instead, to rely on the judge-made fair use doctrine to resolve new problems as they arose. See Register's 1961 Report 25; Register's Supplementary Report 27–28.

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[13] Professor Latman made special mention of the "personal use" issue because the area was one that

> "has become disturbed by recent developments . . . . Photoduplication devices may make authors' and publishers' groups apprehensive. The Copyright Charter recently approved by [the International Confederation of Societies of Authors and Composers] emphasizes the concern of authors over 'private' uses which, because of technological developments, are said to be competing seriously with the author's economic interests." Latman Fair Use Study 33–34.

[14] The one exemption proposed by the Register, permitting a library to make a single photocopy of an out-of-print work and of excerpts that a requester certified were needed for research, met with opposition and was not included in the bills initially introduced in Congress. See Register's 1961 Report 26; H. R. 11947/S. 3008, 88th Cong., 2d Sess. (1964); Regis-

The Register's approach was reflected in the first copyright revision bills, drafted by the Copyright Office in 1964. These bills, like the 1976 Act, granted the copyright owner the exclusive right to reproduce the copyrighted work, subject only to the exceptions set out in later sections. H. R. 11947/S. 3008, 88th Cong., 2d Sess., § 5(a) (1964). The primary exception was fair use, § 6, containing language virtually identical to § 107 of the 1976 Act. Although the copyright revision bills underwent change in many respects from their first introduction in 1964 to their final passage in 1976, these portions of the bills did not change.[16] I can conclude only that Congress, like the Register, intended to rely on the fair use doctrine, and not on a *per se* exemption for

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ter's Supplementary Report 26. A library copying provision was restored to the bill in 1969, after pressure from library associations. Register's Second Supplementary Report, ch. III, pp. 10–11; see S. 543, 91st Cong., 1st Sess., § 108 (Comm. Print Dec. 10, 1969); 1975 Senate Report 48.

[16] The 1964 bills provided that the fair use of copyrighted material for purposes "such as criticism, comment, news reporting, teaching, scholarship, or research" was not an infringement of copyright, and listed four "factors to be considered" in determining whether any other particular use was fair. H. R. 11947/S. 3008, 88th Cong., 2d Sess., § 6 (1964). Revised bills, drafted by the Copyright Office in 1965, contained a fair use provision merely mentioning the doctrine but not indicating its scope: "Notwithstanding the provisions of section 106, the fair use of a copyrighted work is not an infringement of copyright." H. R. 4347/S. 1006, 89th Cong., 1st Sess., § 107 (1965). The House Judiciary Committee restored the provision to its earlier wording, H. R. Rep. No. 2237, 89th Cong., 2d Sess., 5, 58 (1966), and the language adopted by the Committee remained in the bill in later Congresses. See H. R. 2512/S. 597, 90th Cong., 1st Sess., § 107 (1967); S. 543, 91st Cong., 1st Sess., § 107 (1969); S. 644, 92d Cong., 1st Sess., § 107 (1971); S. 1361, 93d Cong., 1st Sess., § 107 (1973); H. R. 2223/S. 22, 94th Cong., 1st Sess., § 107 (1975). With a few additions by the House Judiciary Committee in 1976, see 1976 House Report 5; H. R. Conf. Rep. No. 94–1733, p. 70 (1976), the same language appears in § 107 of the 1976 Act.

private use, to separate permissible copying from the impermissible.[18]

When Congress intended special and protective treatment for private use, moreover, it said so explicitly. One such explicit statement appears in § 106 itself. The copyright owner's exclusive right to *perform* a copyrighted work, in contrast to his right to reproduce the work in copies, is limited. Section 106(4) grants a copyright owner the exclusive right to perform the work "publicly," but does not afford the owner protection with respect to private performances by others. A motion picture is "performed" whenever its images are shown or its sounds are made audible. § 101. Like "sing-[ing] a copyrighted lyric in the shower," *Twentieth Century Music Corp.* v. *Aiken*, 422 U. S. 151, 155 (1975), watching television at home with one's family and friends is now considered a performance. 1975 Senate Report 59–60; 1976 House Report 63.[17] Home television viewing nevertheless does not infringe any copyright—but only because § 106(4) contains the word "publicly."[18] See generally 1975 Senate Report 60–61; 1976 House Report 63–64; Register's 1961 Report 29–30. No such distinction between public and private uses appears in § 106(1)'s prohibition on the making of copies.[19]

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[18] In *Williams & Wilkins Co.* v. *United States*, 203 Ct. Cl. 74, 487 F. 2d 1345 (1973), aff'd by an equally divided Court, 420 U. S. 376 (1975), decided during the process of the revision of the copyright statutes, the Court of Claims suggested that copying for personal use might be outside the scope of copyright protection under the 1909 Act. The court reasoned that because "hand copying" for personal use has always been regarded as permissible, and because the practice of making personal copies continued after typewriters and photostat machines were developed, the making of personal copies by means other than hand copying should be permissible as well. *Id.*, at 84–88, 487 F. 2d, at 1350–1352.

There appear to me to be several flaws in this reasoning. First, it is by no means clear that the making of a "hand copy" of an entire work is permissible; the most that can be said is that there is no reported case on the subject, possibly because no copyright owner ever thought it worthwhile to sue. See Latman Fair Use Study 11–12; 3 M. Nimmer, Copyright § 13.05[E][4][a] (1982). At least one early treatise asserted that infringement would result "if an individual made copies for his personal use, even in his own handwriting, as there is no rule of law excepting manuscript copies from the law of infringment." A. Weil, American Copyright Law § 1066 (1917). Second, hand copying or even copying by typewriter is self-limiting. The drudgery involved in making hand copies ordinarily ensures that only necessary and fairly small portions of a work are taken; it is unlikely that any user would make a hand copy as a substitute for one that could be purchased. The harm to the copyright owner from hand copying thus is minimal. The recent advent of inexpensive and readily available copying machines, however, has changed the dimensions of the problem. See Register's Second Supplementary Report ch. III, p. 3; Hearings on H. R. 2223 before the Subcommittee on Courts, Civil Liberties, and the Administration of Justice of the House Judiciary Committee, 94th Cong., 1st Sess., 194 (1975) (1975 House Hearings) (remarks of Rep. Danielson); *id.*, at 234 (statement of Robert W. Cairns); *id.*, at 250 (remarks of Rep. Danielson); *id.*, at 354 (testimony of Irwin Karp); *id.*, at 467 (testimony of Rondo Cameron); *id.*, at 1795 (testimony of Barbara Ringer, Register of Copyrights). Thus, "[t]he supposition that there is no tort involved in a scholar copying a copyrighted text by hand does not much advance the question of machine copying." B. Kaplan, An Unhurried View of Copyright 101–102 (1967).

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[17] In a trio of cases, *Fortnightly Corp.* v. *United Artists*, 392 U. S. 390, 398 (1968); *Teleprompter Corp.* v. *Columbia Broadcasting System, Inc.*, 415 U. S. 394, 403–405 (1974); and *Twentieth Century Music Corp.* v. *Aiken*, 422 U. S. 151 (1975), this Court had held that the reception of a radio or television broadcast was not a "performance" under the 1909 Act. The Court's "narrow construction" of the word "perform" was "completely overturned by the [1976 Act] and its broad definition of 'perform' in section 101." 1976 House Report 87.

[18] A work is performed "publicly" if it takes place "at a place open to the public or at any place where a substantial number of persons outside of a normal circle of a family and its social acquaintances is gathered." § 101.

[19] One purpose of the exemption for private performances was to permit the home viewing of lawfully made videotapes. The Register noted in 1961 that "[n]ew technical devices will probably make it practical in the future to reproduce televised motion pictures in the home. We do not believe the private *use* of such a reproduction can or should be precluded by copyright." Register's 1961 Report 30 (emphasis added). The Register did not suggest that the private *making* of a reproduction of a televised motion picture would be permitted by the copyright law. The Register

Similarly, an explicit reference to private use appears in § 108. Under that section, a library can make a copy for a patron only for specific types of private use: "private study, scholarship, or research."[20] §§ 108(d)(1) and (e)(1); see 37 CFR § 201.14(b) (1982). Limits also are imposed on the extent of the copying and the type of institution that may make copies, and the exemption expressly is made inapplicable to motion pictures and certain other types of works. § 108(h). These limitations would be wholly superfluous if an entire copy of any work could be made by any person for private use.[21]

B

The District Court in this case nevertheless concluded that the 1976 Act contained an implied exemption for "home-use recording." 480 F. Supp., at 444–446. The court relied primarily on the legislative history of a 1971 amendment to the 1909 Act, a reliance that this Court today does not duplicate. *Ante*, at 11, n. 11. That amendment, however, was addressed to the specific problem of commercial piracy of sound recordings. Act of Oct. 15, 1971, 85 Stat. 391 (1971 Amendment). The House Report on the 1971 Amendment, in a sec-

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later reminded Congress that "[i]n general the concept of 'performance' must be distinguished sharply from the reproduction of copies." Register's Supplementary Report 22.

[20] During hearings on this provision, Representative Danielson inquired whether it would apply to works of fiction such as "Gone With the Wind," or whether it was limited to "strictly technical types of information." The uncontradicted response was that it would apply only in "general terms of science . . . [and] the useful arts." 1975 House Hearings 251 (testimony of Robert W. Cairns); cf. *id.*, at 300 (statement of Harry Rosenfield) ("We are not asking . . . for the right to copy 'Gone With the Wind' ").

[21] The mention in the Senate and House Reports of situations in which copies for private use would be permissible under the fair use doctrine—for example, the making of a free copy for a blind person, 1975 Senate Report 66; 1975 House Report 73, or the "recordings of performances by music students for purposes of analysis and criticism," 1975 Senate Report 63—would be superfluous as well. See n. 12, *supra*.

tion entitled "Home Recording," contains the following statement:

> "In approving the creation of a limited copyright in sound recordings it is the intention of the Committee that this limited copyright not grant any broader rights than are accorded to other copyright proprietors under the existing title 17. Specifically, it is not the intention of the Committee to restrain the home recording, from broadcasts or from tapes or records, of recorded performances, where the home recording is for private use and with no purpose of reproducing or otherwise capitalizing commercially on it. This practice is common and unrestrained today, and the record producers and performers would be in no different position from that of the owners of copyright in recorded musical compositions over the past 20 years." H. R. Rep. No. 92-487, p. 7 (1971) (1971 House Report).

Similar statements were made during House hearings on the bill[22] and on the House floor,[23] although not in the Senate proceedings. In concluding that these statements created a general exemption for home recording, the District Court, in my view, paid too little heed to the context in which the statements were made, and failed to consider the limited purpose of the 1971 Amendment and the structure of the 1909 Act.

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[22] The following exchange took place during the testimony of Barbara Ringer, then Assistant Register of Copyrights:

"[Rep.] Biester. . . . I can tell you I must have a small pirate in my own home. My son has a cassette tape recorder, and as a particular record becomes a hit, he will retrieve it onto his little set. . . . [T]his legislation, of course, would not point to his activities, would it?

"Miss Ringer. I think the answer is clearly, 'No, it would not.' I have spoken at a couple of seminars on video cassettes lately, and this question is usually asked: 'What about the home recorders?' The answer I have given and will give again is that this is something you cannot control. You simply cannot control it. My own opinion, whether this is philosophical dogma or not, is that sooner or later there is going to be a crunch here. But that is not what this legislation is addressed to, and I do not see the crunch coming in the immediate future. . . . I do not see anybody going into anyone's home and preventing this sort of thing, or forcing legislation that would engineer a piece of equipment not to allow home taping." Hearings on S. 646 and H. R. 6927 before Subcommittee No. 3 of the House Committee on the Judiciary, 92d Cong., 1st Sess., 22-23 (1971) (1971 House Hearings).

Unlike television broadcasts and other types of motion pictures, sound recordings were not protected by copyright prior to the passage of the 1971 Amendment. Although the underlying musical work could be copyrighted, the 1909 Act provided no protection for a particular performer's rendition of the work. Moreover, copyrighted musical works that had been recorded for public distribution were subject to a "compulsory license": any person was free to record such a work upon payment of a 2-cent royalty to the copyright owner. § 1(e), 35 Stat. 1075–1076. While reproduction without payment of the royalty was an infringement under the 1909 Act, damages were limited to three times the amount of the unpaid royalty. § 25(e), 35 Stat. 1081–1082; *Shapiro, Bernstein & Co.* v. *Goody*, 248 F. 2d 260, 262–263, 265 (CA2 1957), cert. denied, 355 U. S. 952 (1958). It was observed that the prac-

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[23] Shortly before passage of the bill, a colloquy took place between Representative Kastenmeier, chairman of the House subcommittee that produced the bill, and Representative Kazen, who was not on the committee:

"Mr. Kazen. Am I correct in assuming that the bill protects copyrighted material that is duplicated for commercial purposes only?

"Mr. Kastenmeier. Yes.

"Mr. Kazen. In other words, if your child were to record off of a program which comes through the air on the radio or television, and then used it for her own personal pleasure, for listening pleasure, this use would not be included under the penalties of this bill?

"Mr. Kastenmeier. This is not included in the bill. I am glad the gentleman raises the point.

"On page 7 of the report, under 'Home Recordings,' Members will note that under the bill the same practice which prevails today is called for; namely, this is considered both presently and under the proposed law to be fair use. The child does not do this for commercial purposes. This is made clear in the report." 117 Cong. Rec. 34748–34749 (1971).

tical effect of these provisions was to legalize record piracy. See S. Rep. No. 92-72, p. 4 (1971); 1971 House Report 2.

In order to suppress this piracy, the 1971 Amendment extended copyright protection beyond the underlying work and to the sound recordings themselves. Congress chose, however, to provide only limited protection: owners of copyright in sound recordings were given the exclusive right "[t]o reproduce [their works] and distribute [them] to the public." 1971 Amendment, § 1(a), 85 Stat. 391 (formerly codified as 17 U. S. C. § 1(f) (1976 ed.)).[24] This right was merely the right of commercial distribution. See 117 Cong. Rec. 34748-34749 (1971) (colloquy of Reps. Kazen & Kastenmeier) ("the bill protects copyrighted material that is duplicated for commercial purposes only").

Against this background, the statements regarding home recording under the 1971 Amendment appear in a very different light. If home recording was "common and unrestrained" under the 1909 Act, see 1971 House Report 7, it was because sound recordings had no copyright protection and the owner of a copyright in the underlying musical work could collect no more than a 2-cent royalty plus 6 cents in damages for each unauthorized use. With so little at stake, it is not at all surprising that the Assistant Register "d[id] not see anybody going into anyone's home and preventing this sort of thing." 1971 House Hearings 23.

But the references to home sound recording in the 1971 Amendment's legislative history demonstrate no congressional intent to create a generalized home use exemption from copyright protection. Congress, having recognized that the 1909 Act had been unsuccessful in controlling home sound recording, addressed only the specific problem of commercial record piracy. To quote Assistant Register Ringer again, home use was "not what this legislation [was] addressed to." 1971 House Hearings 22.[8]

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[24] The 1909 Act's grant of an exclusive right to "copy," § 1(a), was of no assistance to the owner of a copyright in a sound recording, because a reproduction of a sound recording was technically considered not to be a "copy." See 1971 House Hearings 18 (testimony of Barbara Ringer, Assistant Register of Copyrights); 1971 Amendment, § 1(e), 85 Stat. 391 (formerly codified as 17 U. S. C. § 26 (1976 ed.)) ("For the purposes of [specified sections, not including § 1(a)], but not for any other purpose, a reproduction of a [sound recording] shall be considered to be a copy thereof"). This concept is carried forward into the 1976 Act, which distinguishes between "copies" and "phonorecords." See n. 7, *supra*.

While the 1971 Amendment narrowed the sound recordings loophole in then existing copyright law, motion pictures and other audiovisual works have been accorded full copyright protection since at least 1912, see Act of Aug. 24, 1912, 37 Stat. 488, and perhaps before, see *Edison* v. *Lubin*, 122 F. 240 (CA3 1903), app. dism'd, 195 U. S. 625 (1904). Congress continued this protection in the 1976 Act. Unlike the sound recording rights created by the 1971 Amendment, the reproduction rights associated with motion pictures under § 106(1) are not limited to reproduction for *public* distribution; the copyright owner's right to reproduce the work exists independently, and the "mere duplication of a copy may constitute an infringement even if it is never distributed." Register's Supplementary Report 16; see 1975 Senate Report 57 and 1976 House Report 61. Moreover, the 1976 Act was intended as a comprehensive treatment of all aspects of copyright law. The reports accompanying the 1976 Act, unlike the 1971 House Report, contain no suggestion that home-use recording is somehow outside the scope of this all-inclusive statute. It was clearly the intent of Congress that no additional exemptions were to be implied.[26]

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[8] During consideration of the 1976 Act, Congress, of course, was well aware of the limited nature of the protection granted to sound recordings under the 1971 Amendment. See 1975 House Hearings 113 (testimony of Barbara Ringer, Register of Copyrights) (1971 Amendment "created a copyright in a sound recording . . . but limited it to the particular situation of so-called piracy"); *id.*, at 1380 (letter from John Lorenz, Acting Librarian of Congress) (under 1971 Amendment "only the unauthorized reproduction and distribution to the public of copies of the sound recording is prohibited. Thus, the duplication of sound recordings for private, personal use and the performance of sound recordings through broadcasting or other means are outside the scope of the amendment").

I therefore find in the 1976 Act no implied exemption to cover the home taping of television programs, whether it be for a single copy, for private use, or for home use. Taping a copyrighted television program is infringement unless it is permitted by the fair use exemption contained in § 107 of the 1976 Act. I now turn to that issue.

IV

Fair Use

The doctrine of fair use has been called, with some justification, "the most troublesome in the whole law of copyright." *Dellar* v. *Samuel Goldwyn, Inc.*, 104 F. 2d 661, 662 (CA2 1939); see *Triangle Publications, Inc.* v. *Knight-Ridder Newspapers, Inc.*, 626 F. 2d 1171, 1174 (CA5 1980); *Meeropol* v. *Nizer*, 560 F. 2d 1061, 1068 (CA2 1977), cert. denied, 434 U. S. 1013 (1978). Although courts have constructed lists of factors to be considered in determining whether a particular use is fair,[27] no fixed criteria have emerged by which that determination can be made. This Court thus far has provided no guidance; although fair use issues have come here twice, on each occasion the Court was equally divided and no opinion was forthcoming. *Williams & Wilkins Co.* v. *United States*, 203 Ct. Cl. 74, 487 F. 2d 1345 (1973), aff'd, 420 U. S. 376 (1975); *Benny* v. *Loew's, Inc.*, 239 F. 2d 532 (CA9 1956), aff'd *sub nom. CBS, Inc.* v. *Loew's Inc.*, 356 U. S. 43 (1958).

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[26] Representative Kastenmeier, the principal House sponsor of the 1976 revision bill and chairman of the House subcommittee that produced it, made this explicit on the opening day of the House hearings:

"[F]rom time to time, certain areas have not been covered in the bill. But is it not the case, this being a unified code, that the operation of the bill does apply whether or not we specifically deal with a subject or not? . . .

"Therefore, we can really not fail to deal with an issue. It will be dealt with one way or the other. The code, title 17, will cover it. So we have made a conscious decision even by omission. . . .

"By virtue of passing this bill, we will deal with every issue. Whether we deal with it completely or not for the purpose of resolving the issues involved is the only question, not whether it has dealt with the four corners of the bill because the four corners of the bill will presume to deal with everything in copyright." 1975 House Hearings 115.

[27] The precise phrase "fair use" apparently did not enter the case law until 1869, see *Lawrence* v. *Dana*, 15 F. Cas. 26, 60 (No. 8,136) (CC Mass.), but the doctrine itself found early expression in *Folsom* v. *Marsh*, 9 F. Cas. 342 (No. 4,901) (CC Mass. 1841). Justice Story was faced there

Nor did Congress provide definitive rules when it codified the fair use doctrine in the 1976 Act; it simply incorporated a list of factors "to be considered": the "purpose and character of the use," the "nature of the copyrighted work," the "amount and substantiality of the portion used," and, perhaps the most important, the "effect of the use upon the *potential* market for or value of the copyrighted work" (emphasis supplied). § 107. No particular weight, however, was assigned to any of these, and the list was not intended to be exclusive. The House and Senate Reports explain that § 107 does no more than give "statutory recognition" to the fair use doctrine; it was intended "to restate the present judicial doctrine

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with the "intricate and embarrassing questio[n]" whether a biography containing copyrighted letters was "a justifiable use of the original materials, such as the law recognizes as no infringement of the copyright of the plaintiffs." *Id.*, at 344, 348. In determining whether the use was permitted, it was necessary, said Justice Story, to consider "the nature and objects of the selections made, the quantity and value of the materials used, and the degree in which the use may prejudice the sale, or diminish the profits, or supersede the objects, of the original work. . . . Much must, in such cases, depend upon the nature of the new work, the value and extent of the copies, and the degree in which the original authors may be injured thereby." *Id.*, at 348–349.

Similar lists were compiled by later courts. See, *e. g.*, *Tennessee Fabricating Co.* v. *Moultrie Mfg. Co.*, 421 F. 2d 279, 283 (CA5), cert. denied, 398 U. S. 928 (1970); *Mathews Conveyer Co.* v. *Palmer-Bee Co.*, 135 F. 2d 73, 85 (CA6 1943); *Columbia Pictures Corp.* v. *National Broadcasting Co.*, 137 F. Supp. 348 (SD Cal. 1955); *Shapiro, Bernstein & Co.* v. *P. F. Collier & Son Co.*, 26 U. S. P. Q. 40, 43 (SDNY 1934); *Hill* v. *Whalen & Martell, Inc.*, 220 F. 359, 360 (SDNY 1914).

of fair use, not to change, narrow, or enlarge it in any way." 1976 House Report 66. See 1975 Senate Report 62; S. Rep. No. 93-983, p. 116 (1974); H. R. Rep. No. 83, 90th Cong., 1st Sess., 32 (1967); H. R. Rep. No. 2237, 89th Cong., 2d Sess., 61 (1966).

A

Despite this absence of clear standards, the fair use doctrine plays a crucial role in the law of copyright. The purpose of copyright protection, in the words of the Constitution, is to "promote the Progress of Science and useful Arts." Copyright is based on the belief that by granting authors the exclusive rights to reproduce their works, they are given an incentive to create, and that "encouragement of individual effort by personal gain is the best way to advance public welfare through the talents of authors and inventors in 'Science and the useful Arts.'" *Mazer* v. *Stein*, 347 U. S. 201, 219 (1954). The monopoly created by copyright thus rewards the individual author in order to benefit the public. *Twentieth Century Music Corp.* v. *Aiken*, 422 U. S. 151, 156 (1975); *Fox Film Corp.* v. *Doyal*, 286 U. S. 123, 127–128 (1932); see H. R. Rep. No. 2222, 60th Cong., 2d Sess., 7 (1909).

There are situations, nevertheless, in which strict enforcement of this monopoly would inhibit the very "Progress of Science and useful Arts" that copyright is intended to promote. An obvious example is the researcher or scholar whose own work depends on the ability to refer to and to quote the work of prior scholars. Obviously, no author could create a new work if he were first required to repeat the research of every author who had gone before him.[29] The scholar, like the ordinary user, of course could be left to bargain with each copyright owner for permission to quote from or refer to prior works. But there is a crucial difference between the scholar and the ordinary user. When the ordinary user decides that the owner's price is too high, and forgoes use of the work, only the individual is the loser. When the scholar forgoes the use of a prior work, not only does his own work suffer, but the public is deprived of his contribution to knowledge. The scholar's work, in other words, produces external benefits from which everyone profits. In such a case, the fair use doctrine acts as a form of subsidy—albeit at the first author's expense—to permit the second author to make limited use of the first author's work for the public good. See Latman Fair Use Study 31; Gordon, Fair Use as Market Failure: A Structural Analysis of the *Betamax* Case and its Predecessors, 82 Colum. L. Rev. 1600, 1630 (1982).

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[29] "The world goes ahead because each of us builds on the work of our predecessors. 'A dwarf standing on the shoulders of a giant can see farther than the giant himself.'" Chafee, Reflections on the Law of Copyright: I, 45 Colum. L. Rev. 503, 511 (1945).

A similar subsidy may be appropriate in a range of areas other than pure scholarship. The situations in which fair use is most commonly recognized are listed in § 107 itself; fair use may be found when a work is used "for purposes such as criticism, comment, news reporting, teaching, . . . scholarship, or research." The House and Senate Reports expand on this list somewhat,[*] and other examples may be found in the case law.[*] Each of these uses, however, reflects a common theme: each is a *productive* use, resulting in some added benefit to the public beyond that produced by the first author's work.[31] The fair use doctrine, in other words, permits works to be used for "socially laudable purposes." See Copyright Office, Briefing Papers on Current Issues, reprinted in 1975 House Hearings 2051, 2055. I am aware of no case in which the reproduction of a copyrighted work for the sole benefit of the user has been held to be fair use.[32]

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[*] Quoting from the Register's 1961 Report, the Senate and House Reports give examples of possible fair uses:

"'quotation of excerpts in a review or criticism for purposes of illustration or comment; quotation of short passages in a scholarly or technical work, for illustration or clarification of the author's observations; use in a parody of some of the content of the work parodied; summary of an address or article, with brief quotations, in a news report; reproduction by a library of a portion of a work to replace part of a damaged copy; reproduction by a teacher or student of a small part of a work to illustrate a lesson; reproduction of a work in legislative or judicial proceedings or reports; incidental and fortuitous reproduction, in a newsreel or broadcast, of a work located in the scene of an event being recorded.'" 1975 Senate Report 61–62; 1976 House Report 65.

[*] See, *e. g.*, *Triangle Publications, Inc.* v. *Knight-Ridder Newspapers, Inc.*, 626 F. 2d 1171 (CA5 1980) (comparative advertising).

I do not suggest, of course, that every productive use is a fair use. A finding of fair use still must depend on the facts of the individual case, and on whether, under the circumstances, it is reasonable to expect the user to bargain with the copyright owner for use of the work. The fair use doctrine must strike a balance between the dual risks created by the copyright system: on the one hand, that depriving authors of their monopoly will reduce their incentive to create, and, on the other, that granting authors a complete monopoly will reduce the creative ability of others.[39] The inquiry is necessarily a flexible one, and the endless variety of situations that may arise precludes the formulation of exact rules. But when a user reproduces an entire work and uses it for its original purpose, with no added benefit to the public, the doctrine of fair use usually does not apply. There is then no need whatsoever to provide the ordinary user with a fair use subsidy at the author's expense.

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[31] Professor Seltzer has characterized these lists of uses as "reflect[ing] what in fact the subject matter of fair use has in the history of its adjudication consisted in: it has always had to do with the use by a second author of a first author's work." L. Seltzer, Exemptions and Fair Use in Copyright 24 (1978) (emphasis removed). He distinguishes "the mere reproduction of a work in order to use it for its intrinsic purpose—to make what might be called the 'ordinary' use of it." When copies are made for "ordinary" use of the work, "ordinary *infringement* has customarily been triggered, not notions of fair use" (emphasis in original). *Ibid.* See also M. Nimmer, Copyright § 13.05[A][1] (1982) ("Use of a work in each of the foregoing contexts either necessarily or usually involves its use in a derivative work").

[32] *Williams & Wilkins Co.* v. *United States*, 203 Ct. Cl. 74, 487 F. 2d 1345 (1973), aff'd by an equally divided Court, 420 U. S. 376 (1975), involved the photocopying of scientific journal articles; the Court of Claims stressed that the libraries performing the copying were "devoted solely to the advancement and dissemination of medical knowledge," 203 Ct. Cl., at 91, 487 F. 2d, at 1354, and that "medical science would be seriously hurt if such library photocopying were stopped." *Id.*, at 95, 487 F. 2d, at 1356.

The issue of library copying is now covered by § 108 of the 1976 Act. That section, which Congress regarded as "authoriz[ing] certain photocopying practices which may not qualify as a fair use," 1975 Senate Report 67; 1976 House Report 74, permits the making of copies only for "private study, scholarship, or research." §§ 108(d)(1) and (e)(1).

The making of a videotape recording for home viewing is an ordinary rather than a productive use of the Studios' copyrighted works. The District Court found that "Betamax owners use the copy for the same purpose as the original. They add nothing of their own." 480 F. Supp., at 453. Although applying the fair use doctrine to home VTR recording, as Sony argues, may increase public access to material broadcast free over the public airwaves, I think Sony's argument misconceives the nature of copyright. Copyright gives the author a right to limit or even to cut off access to his work. *Fox Film Corp.* v. *Doyal*, 286 U. S. 123, 127 (1932). A VTR recording creates no public benefit sufficient to justify limiting this right. Nor is this right extinguished by the copyright owner's choice to make the work available over the airwaves. Section 106 of the 1976 Act grants the copyright owner the exclusive right to control the performance and the reproduction of his work, and the fact that he has licensed a single television performance is really irrelevant to the existence of his right to control its reproduction. Although a television broadcast may be free to the viewer, this fact is equally irrelevant; a book borrowed from the public library may not be copied any more freely than a book that is purchased.

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[39] In the words of Lord Mansfield: "[W]e must take care to guard against two extremes equally prejudicial; the one, that men of ability, who have employed their time for the service of the community, may not be deprived of their just merits, and the reward of their ingenuity and labour; the other, that the world may not be deprived of improvements, nor the progress of the arts be retarded." *Sayre* v. *Moore*, 1 East 361 n. (b), 102 Eng. Rep. 139, 140 n. (b) (K. B. 1785). See Register's Supplementary Report 13.

It may be tempting, as, in my view, the Court today is tempted, to stretch the doctrine of fair use so as to permit unfettered use of this new technology in order to increase access to television programming. But such an extension risks eroding the very basis of copyright law, by depriving authors of control over their works and consequently of their incentive to create.[34] Even in the context of highly productive educational uses, Congress has avoided this temptation; in passing the 1976 Act, Congress made it clear that off-the-air videotaping was to be permitted only in very limited situations. See 1976 House Report 71; 1975 Senate Report 64. And, the Senate report adds, "[t]he committee does not intend to suggest . . . that off-the-air recording for convenience would under any circumstances, be considered 'fair use.'" *Id.*, at 66. I cannot disregard these admonitions.

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[34] This point was brought home repeatedly by the Register of Copyrights. Mentioning the "multitude of technological developments" since passage of the 1909 Act, including "remarkable developments in the use of video tape," Register's Supplementary Report xiv–xv, the Register cautioned:

"I realize, more clearly now than I did in 1961, that the revolution in communications has brought with it a serious challenge to the author's copyright. This challenge comes not only from the ever-growing commercial interests who wish to use the author's works for private gain. An equally serious attack has come from people with a sincere interest in the public welfare who fully recognize . . . 'that the real heart of civilization . . . owes its existence to the author'; ironically, in seeking to make the author's works widely available by freeing them from copyright restrictions, they fail to realize that they are whittling away the very thing that nurtures authorship in the first place. An accommodation among conflicting demands must be worked out, true enough, but not by denying the fundamental constitutional directive: to encourage cultural progress by securing the author's exclusive rights to him for a limited time." *Id.*, at xv; see 1975 House Hearings 117 (testimony of Barbara Ringer, Register of Copyrights).

B

I recognize, nevertheless, that there are situations where permitting even an unproductive use would have no effect on the author's incentive to create, that is, where the use would not affect the value of, or the market for, the author's work. Photocopying an old newspaper clipping to send to a friend may be an example; pinning a quotation on one's bulletin board may be another. In each of these cases, the effect on the author is truly *de minimis*. Thus, even though these uses provide no benefit to the public at large, no purpose is served by preserving the author's monopoly, and the use may be regarded as fair.

Courts should move with caution, however, in depriving authors of protection from unproductive "ordinary" uses. As has been noted above, even in the case of a productive use, § 107(4) requires consideration of "the effect of the use upon the *potential* market for or value of the copyrighted work" (emphasis added). "[A] particular use which may seem to have little or no economic impact on the author's rights today can assume tremendous importance in times to come." Register's Supplementary Report 14. Although such a use may seem harmless when viewed in isolation, "[i]solated instances of minor infringements, when multiplied many times, become in the aggregate a major inroad on copyright that must be prevented." 1975 Senate Report 65.

I therefore conclude that, at least when the proposed use is an unproductive one, a copyright owner need prove only a *potential* for harm to the market for or the value of the copyrighted work. See 3 M. Nimmer, Copyright § 13.05[E][4][c], p. 13-84 (1982). Proof of actual harm, or even probable harm, may be impossible in an area where the effect of a new technology is speculative, and requiring such proof would present the "real danger . . . of confining the scope of an author's rights on the basis of the present technology so that, as the years go by, his copyright loses much of its value because of unforeseen technical advances." Register's Supplementary Report 14. Infringement thus would be found if the copyright owner demonstrates a reasonable possibility that harm will result from the proposed use. When the use is one that creates no benefit to the public at large, copyright protection should not be denied on the basis that a new technology that may result in harm has not yet done so.

The Studios have identified a number of ways in which VTR recording could damage their copyrights. VTR recording could reduce their ability to market their works in movie theaters and through the rental or sale of pre-recorded videotapes or videodiscs; it also could reduce their rerun audience, and consequently the license fees available to them for repeated showings. Moreover, advertisers may be willing to pay for only "live" viewing audiences, if they believe VTR viewers will delete commercials or if rating services are unable to measure VTR use; if this is the case, VTR recording could reduce the license fees the Studios are able to charge even for first-run showings. Library-building may raise the potential for each of the types of harm identified by the Studios, and time-shifting may raise the potential for substantial harm as well.[33]

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[33] A VTR owner who has taped a favorite movie for repeated viewing will be less likely to rent or buy a tape containing the same movie, watch a televised rerun, or pay to see the movie at a theater. Although time-shifting may not replace theater or rerun viewing or the purchase of prerecorded tapes or discs, it may well replace rental usage; a VTR user who has recorded a first-run movie for later viewing will have no need to rent a copy when he wants to see it. Both library-builders and time-shifters may avoid commercials; the library builder may use the pause control to record without them, and all users may fast-forward through commercials on playback.

The Studios introduced expert testimony that both time-shifting and librarying would tend to decrease their revenue from copyrighted works. See 480 F. Supp., at 440. The District Court's findings also show substantial library-building and avoidance of commercials. Both sides submitted surveys showing that the average Betamax user owns between 25 and 32 tapes. The Studios' survey showed that at least 40% of users had more

Although the District Court found no likelihood of harm from VTR use, 480 F. Supp., at 468, I conclude that it applied an incorrect substantive standard and misallocated the burden of proof. The District Court reasoned that the Studios had failed to prove that library-building would occur "to any significant extent," *id.*, at 467; that the Studios' prerecorded videodiscs could compete with VTR recordings and were "arguably . . . more desirable," *ibid*; that it was "not clear that movie audiences will decrease," *id.*, at 468; and that the practice of deleting commercials "may be too tedious" for many viewers, *ibid*. To the extent any decrease in advertising revenues would occur, the court concluded that the Studios had "marketing alternatives at hand to recoup some of that predicted loss." *Id.*, at 452. Because the Studios' prediction of harm was "based on so many assumptions and on a system of marketing which is rapidly changing," the court was "hesitant to identify 'probable effects' of home-use copying." *Ibid.*

The District Court's reluctance to engage in prediction in this area is understandable, but, in my view, the court was mistaken in concluding that the Studios should bear the risk created by this uncertainty. The Studios have demonstrated a potential for harm, which has not been, and could not be, refuted at this early stage of technological development.

The District Court's analysis of harm, moreover, failed to consider the effect of VTR recording on "the *potential* market for or the value of the copyrighted work," as required by § 107(4).[36] The requirement that a putatively infringing use

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than 10 tapes in a "library"; Sony's survey showed that more than 40% of users planned to view their tapes more than once; and both sides' surveys showed that commercials were avoided at least 25% of the time. *Id.*, at 438–439.

[36] Concern over the impact of a use upon "potential" markets is to be found in cases decided both before and after § 107 lent Congress' imprimatur to the judicially-created doctrine of fair use. See, *e. g.*, *Iowa State University Research Foundation, Inc.* v. *American Broadcasting Cos.*,

of a copyrighted work, to be "fair," must not impair a "potential" market for the work has two implications. First, an infringer cannot prevail merely by demonstrating that the copyright holder suffered no net harm from the infringer's action. Indeed, even a showing that the infringement has resulted in a net benefit to the copyright holder will not suffice. Rather, the infringer must demonstrate that he had not impaired the copyright holder's ability to demand compensation from (or to deny access to) any group who would otherwise be willing to pay to see or hear the copyrighted work. Second, the fact that a given market for a copyrighted work would not be available to the copyright holder were it not for the infringer's activities does not permit the infringer to exploit that market without compensating the copyright holder. See *Iowa State University Research Foundation, Inc.* v. *American Broadcasting Cos.*, 621 F. 2d 57 (CA2 1980).

In this case, the Studios and their *amici* demonstrate that the advent of the the VTR technology created a potential market for their copyrighted programs. That market consists of those persons who find it impossible or inconvenient to watch the programs at the time they are broadcast, and who wish to watch them at other times. These persons are willing to pay for the privilege of watching copyrighted work at their convenience, as is evidenced by the fact that they are willing to pay for VTRs and tapes; undoubtedly, most also

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621 F. 2d 57, 60 (CA2 1980) ("the effect of the use on the copyright holder's potential market for the work"); *Meeropol* v. *Nizer*, 560 F. 2d 1061, 1070 (CA2 1977) ("A key issue in fair use cases is whether the defendant's work tends to diminish or prejudice the potential sale of plaintiff's work"), cert. denied, 434 U. S. 1013 (1978); *Williams & Wilkins Co.* v. *United States*, 203 Ct. Cl. 74, 88, 487 F. 2d 1345, 1352 (1973) ("the effect of the use on a copyright owner's potential market for and value of his work"), aff'd by an equally divided Court, 420 U. S. 376 (1975); *Encyclopaedia Britannica Educational Corp.* v. *Crooks*, 542 F. Supp. 1156, 1173 (WDNY 1982) ("[T]he concern here must be focused on a copyrighted work's *potential* market. It is perfectly possible that plaintiffs' profits would have been greater, but for the kind of videotaping in question") (emphasis in original).

would be willing to pay some kind of royalty to copyright holders. The Studios correctly argue that they have been deprived of the ability to exploit this sizable market.

It is thus apparent from the record and from the findings of the District Court that time-shifting does have a substantial adverse effect upon the "potential market for" the Studios' copyrighted works. Accordingly, even under the formulation of the fair use doctrine advanced by Sony, time-shifting cannot be deemed a fair use.

V

Contributory Infringement

From the Studios' perspective, the consequences of home VTR recording are the same as if a business had taped the Studios' works off the air, duplicated the tapes, and sold or rented them to members of the public for home viewing. The distinction is that home VTR users do not record for commercial advantage; the commercial benefit accrues to the manufacturer and distributors of the Betamax. I thus must proceed to discuss whether the manufacturer and distributors can be held contributorily liable if the product they sell is used to infringe.

It is well established that liability for copyright infringement can be imposed on persons other than those who actually carry out the infringing activity. *Kalem Co.* v. *Harper Brothers*, 222 U. S. 55, 62–63 (1911); 3 M. Nimmer, Copyright § 12.04[A] (1982); see *Twentieth Century Music Corp.* v. *Aiken*, 422 U. S. 151, 160, n. 11 (1975); *Buck* v. *Jewell-La-Salle Realty Co.*, 283 U. S. 191, 198 (1931). Although the liability provision of the 1976 Act provides simply that "[a]nyone who violates any of the exclusive rights of the copyright owner . . . is an infringer of the copyright," 17 U. S. C. § 501(a), the House and Senate Reports demonstrate that Congress intended to retain judicial doctrines of contributory infringement. 1975 Senate Report 57; 1976 House Report 61.[17]

The doctrine of contributory copyright infringement, however, is not well-defined. One of the few attempts at definition appears in *Gershwin Publishing Corp.* v. *Columbia Artists Management, Inc.*, 443 F. 2d 1159 (CA2 1971). In that case the Second Circuit stated that "one who, with knowledge of the infringing activity, induces, causes or materially contributes to the infringing conduct of another, may be held liable as a 'contributory' infringer." *Id.*, at 1162 (footnote omitted). While I have no quarrel with this general statement, it does not easily resolve the present case; the District Court and the Court of Appeals, both purporting to apply it, reached diametrically opposite results.

A

In absolving Sony from liability, the District Court reasoned that Sony had no direct involvement with individual Betamax users, did not participate in any off-the-air copying, and did not know that such copying was an infringement of the Studios' copyright. 480 F. Supp., at 460. I agree with the *Gershwin* court that contributory liability may be imposed even when there has been no direct contact between the defendant and the infringer. The defendant in *Gershwin* was a concert promoter operating through local concert associations that it sponsored; it had no contact with the infringing performers themselves. 443 F. 2d, at 1162–1163. See also *Twentieth Century Music Corp.* v. *Aiken*, 422 U. S., at

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[17] This intent is manifested further by provisions of the 1976 Act that exempt from liability persons who, while not participating directly in any infringing activity, could otherwise be charged with contributory infringement. See § 108(f)(1) (library not liable "for the unsupervised use of reproducing equipment located on its premises," provided that certain warnings are posted); § 110(6) ("governmental body" or "nonprofit agricultural or horticultural organization" not liable for infringing performance by concessionaire "in the course of an annual agricultural or horticultural fair or exhibition").

160, n. 11. Moreover, a finding of contributory infringement has never depended on actual knowledge of particular instances of infringement; it is sufficient that the defendant have reason to know that infringement is taking place. 443 F. 2d, at 1162; see *Screen Gems-Columbia Music, Inc.* v. *Mark-Fi Records, Inc.*, 256 F. Supp. 399 (SDNY 1966).[38] In the so-called "dance hall" cases, in which questions of contributory infringement arise with some frequency, proprietors of entertainment establishments routinely are held liable for unauthorized performances on their premises, even when they have no knowledge that copyrighted works are being performed. In effect, the proprietors in those cases are charged with constructive knowledge of the performances.[39]

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[38] In *Screen Gems*, on which the *Gershwin* court relied, the court held that liability could be imposed on a shipper of unauthorized "bootleg" records and a radio station that broadcast advertisements of the records, provided they knew or should have known that the records were infringing. The court concluded that the records' low price and the manner in which the records were marketed could support a finding of "constructive knowledge" even if actual knowledge were not shown.

[39] See, *e. g.*, *Famous Music Corp.* v. *Bay State Harness Horse Racing & Breeding Assn., Inc.*, 554 F. 2d 1213 (CA1 1977); *Dreamland Ball Room, Inc.* v. *Shapiro, Bernstein & Co.*, 36 F. 2d 354 (CA7 1929); *M. Witmark & Sons* v. *Tremont Social & Athletic Club*, 188 F. Supp. 787, 790 (Mass. 1960); see also *Twentieth Century Music Corp.* v. *Aiken*, 422 U. S., at 157; *Buck* v. *Jewell-LaSalle Realty Co.*, 283 U. S. 191, 198–199 (1931); 3 M. Nimmer, Copyright § 12.04[A], pp. 12–35 (1982).

Courts have premised liability in these cases on the notion that the defendant had the ability to supervise or control the infringing activities, see, *e. g.*, *Shapiro, Bernstein & Co.* v. *H. L. Green Co.*, 316 F. 2d 304, 307 (CA2 1963); *KECA Music, Inc.* v. *Dingus McGee's Co.*, 432 F. Supp. 72, 74 (WD Mo. 1977). This notion, however, is to some extent fictional; the defendant cannot escape liability by instructing the performers not to play copyrighted music, or even by inserting a provision to that effect into the performers' contract. *Famous Music Corp.* v. *Bay State Harness Horse Racing & Breeding Assn., Inc.*, 554 F. 2d, at 1214–1215; *KECA Music, Inc.* v. *Dingus McGee's Co.*, 432 F. Supp., at 75; *Shapiro, Bernstein & Co.* v. *Veltin*, 47 F. Supp. 648, 649 (WD La. 1942). Congress expressly re-

Nor is it necessary that the defendant be aware that the infringing activity violates the copyright laws. Section 504(c)(2) of the 1976 Act provides for a reduction in statutory damages when an infringer proves he "was not aware and had no reason to believe that his or her acts constituted an infringement of copyright," but the statute establishes no general exemption for those who believe their infringing activities are legal. Moreover, such an exemption would be meaningless in a case such as this, in which prospective relief is sought; once a court has established that the copying at issue is infringement, the defendants are necessarily aware of that fact for the future. It is undisputed in this case that Sony had reason to know the Betamax would be used by some owners to tape copyrighted works off the air. See 480 F. Supp., at 459–460.

The District Court also concluded that Sony had not caused, induced, or contributed materially to any infringing activities of Betamax owners. 480 F. Supp., at 460. In a case of this kind, however, causation can be shown indirectly; it does not depend on evidence that particular Betamax owners relied on particular advertisements. In an analogous case decided just two Terms ago, this Court approved a lower court's conclusion that liability for contributory trademark infringement could be imposed on a manufacturer who "suggested, even by implication" that a retailer use the manufacturer's goods to infringe the trademark of another. *Inwood Laboratories, Inc.* v. *Ives Laboratories, Inc.*, 456

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jected a proposal to exempt proprietors from this type of liability under the 1976 Act. See 1975 Senate Report 141–142; 1976 House Report 159–160; 1975 House Hearings 1812–1813 (testimony of Barbara Ringer, Register of Copyrights); *id.*, at 1813 (colloquy between Rep. Pattison and Barbara Ringer).

The Court's attempt to distinguish these cases on the ground of "control," *ante*, at 18, is obviously unpersuasive. The direct infringer ordinarily is not employed by the person held liable; instead, he is an independent contractor. Neither is he always an agent of the person held liable; *Screen Gems* makes this apparent.

U. S. 844, 851 (1982); see *id.*, at 860 (concurring opinion). I think this standard is equally appropriate in the copyright context.

The District Court found that Sony has advertised the Betamax as suitable for off-the-air recording of "favorite shows," "novels for television," and "classic movies," 480 F. Supp., at 436, with no visible warning that such recording could constitute copyright infringement. It is only with the aid of the Betamax or some other VTR, that it is possible today for home television viewers to infringe copyright by recording off-the-air. Off-the-air recording is not only a foreseeable use for the Betamax, but indeed is its intended use. Under the circumstances, I agree with the Court of Appeals that if off-the-air recording is an infringement of copyright, Sony has induced and materially contributed to the infringing conduct of Betamax owners.[*]

B

Sony argues that the manufacturer or seller of a product used to infringe is absolved from liability whenever the product can be put to any substantial noninfringing use. Brief for Petitioners 41–42. The District Court so held, borrowing the "staple article of commerce" doctrine governing liability for contributory infringement of patents. See 35 U. S. C.

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[*] My conclusion respecting contributory infringement does not include the retailer defendants. The District Court found that one of the retailer defendants had assisted in the advertising campaign for the Betamax, but made no other findings respecting their knowledge of the Betamax's intended uses. I do not agree with the Court of Appeals, at least on this record, that the retailers "are sufficiently engaged in the enterprise to be held accountable," 659 F. 2d, at 976. In contrast, the advertising agency employed to promote the Betamax was far more actively engaged in the advertising campaign, and petitioners have not argued that the agency's liability differs in any way from that of Sony Corporation and Sony Corporation of America.

§271.[41] This Court today is much less positive. See *ante*, at 22. I do not agree that this technical judge-made doctrine of patent law, based in part on considerations irrelevant to the field of copyright, see generally *Dawson Chemical Co.* v. *Rohm & Haas Co.*, 448 U. S. 176, 187–199 (1980), should be imported wholesale into copyright law. Despite their common constitutional source, see U. S. Const., Art. I, §8, cl. 8, patent and copyright protections have not developed in a parallel fashion, and this Court in copyright cases in the past has borrowed patent concepts only sparingly. See *Bobbs-Merrill Co.* v. *Straus*, 210 U. S. 339, 345–346 (1908).

I recognize, however, that many of the concerns underlying the "staple article of commerce" doctrine are present in copyright law as well. As the District Court noted, if liability for contributory infringement were imposed on the manufacturer or seller of every product used to infringe—a typewriter, a camera, a photocopying machine—the "wheels of commerce" would be blocked. 480 F. Supp., at 461; see also *Kalem Co.* v. *Harper Brothers*, 222 U. S., at 62.

I therefore conclude that if a *significant* portion of the product's use is *noninfringing*, the manufacturers and sellers cannot be held contributorily liable for the product's infringing uses. See *ante*, at 22. If virtually all of the product's use, however, is to infringe, contributory liability may be imposed; if no one would buy the product for noninfringing purposes alone, it is clear that the manufacturer is purposely profiting from the infringement, and that liability is appropriately imposed. In such a case, the copyright owner's monopoly would not be extended beyond its proper bounds; the manufacturer of such a product contributes to the infringing activities of others and profits directly thereby, while providing no benefit to the public sufficient to justify the infringement.

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[41] The "staple article of commerce" doctrine protects those who manufacture products incorporated into or used with patented inventions—for example, the paper and ink used with patented printing machines, *Henry* v. *A. B. Dick Co.*, 224 U. S. 1 (1912), or the dry ice used with patented refrigeration systems, *Carbice Corp.* v. *American Patents Corp.*, 283 U. S. 27 (1931). Because a patent-holder has the right to control the use of the patented item as well as its manufacture, see *Motion Picture Patents Co.* v. *Universal Film Co.*, 243 U. S. 502, 509–510 (1917); 35 U. S. C. 271(a), such protection for the manufacturer of the incorporated product is necessary to prevent patent-holders from extending their monopolies by suppressing competition in unpatented components and supplies suitable for use with the patented item. See *Dawson Chemical Co.* v. *Rohm & Haas Co.*, 448 U. S. 176, 197–198 (1980). The doctrine of contributory patent infringement has been the subject of attention by the courts and by Congress, see *id.*, at 202–212, and has been codified since 1952, 66 Stat. 792, but was never mentioned during the copyright law revision process as having any relevance to contributory *copyright* infringement.

The Court of Appeals concluded that Sony should be held liable for contributory infringement, reasoning that "[v]ideotape recorders are manufactured, advertised, and sold for the primary purpose of reproducing television programming," and "[v]irtually all television programming is copyrighted material." 659 F. 2d, at 975. While I agree with the first of these propositions,[illegible] the second, for me, is problematic. The key question is not the amount of television programming that is copyrighted, but rather the amount of VTR usage that is infringing.[illegible] Moreover, the parties and their *amici* have argued vigorously about both the amount of television programming that is covered by copyright and the amount for

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[illegible] Although VTRs also may be used to watch prerecorded video cassettes and to make home motion pictures, these uses do not require a tuner such as the Betamax contains. See n. 1, *supra*. The Studios do not object to Sony's sale of VTRs without tuners. Brief for Respondents 5, n. 9. In considering the noninfringing uses of the Betamax, therefore, those uses that would remain possible without the Betamax's built-in tuner should not be taken into account.

[illegible] Noninfringing uses would include, for example, recording works that are not protected by copyright, recording works that have entered the public domain, recording with permission of the copyright owner, and, of course, any recording that qualifies as fair use. See, *e. g.*, *Bruzzone* v. *Miller Brewing Co.*, 202 U. S. P. Q. 809 (ND Cal. 1979) (use of home VTR for market research studies).

which permission to copy has been given. The proportion of VTR recording that is infringing is ultimately a question of fact,[44] and the District Court specifically declined to make findings on the "percentage of legal versus illegal home-use recording." 480 F. Supp., at 468. In light of my view of the law, resolution of this factual question is essential. I therefore would remand the case for further consideration of this by the District Court.

VI

The Court has adopted an approach very different from the one I have outlined. It is my view that the Court's approach alters dramatically the doctrines of fair use and contributory infringement as they have been developed by Congress and the courts. Should Congress choose to respond to the Court's decision, the old doctrines can be resurrected. As it stands, however, the decision today erodes much of the coherence that these doctrines have struggled to achieve.

The Court's disposition of the case turns on its conclusion that time-shifting is a fair use. Because both parties agree that time-shifting is the primary use of VTRs, that conclusion, if correct, would settle the issue of Sony's liability under almost any definition of contributory infringement. The

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[44] Sony asserts that much or most television broadcasting is available for home recording because (1) no copyright owner other than the Studios has brought an infringement action, and (2) much televised material is ineligible for copyright protection because videotapes of the broadcasts are not kept. The first of these assertions is irrelevant; Sony's liability does not turn on the fact that only two copyright owners thus far have brought suit. The amount of infringing use must be determined through consideration of the television market as a whole. Sony's second assertion is based on a faulty premise; the Copyright Office permits audiovisual works transmitted by television to be registered by deposit of sample frames plus a description of the work. See 37 CFR §§ 202.20(c)(2)(ii) and 202.21(g) (1982). Moreover, although an infringement action cannot be brought unless the work is registered, 17 U. S. C. § 411(a), registration is not a condition of copyright protection. § 408(a). Copying an unregistered work still may be infringement. Cf. § 506(a) (liability for criminal copyright infringement; not conditioned on prior registration).

Court concludes that time-shifting is fair use for two reasons. Each is seriously flawed.

The Court's first reason for concluding that time-shifting is fair use is its claim that many copyright holders have no objection to time-shifting, and that "respondents have no right to prevent other copyright holders from authorizing it for their programs." *Ante*, at 23. The Court explains that a finding of contributory infringement would "inevitably frustrate the interests of broadcasters in reaching the portion of their audience that is available only through time-shifting." *Ante*, at 26. Such reasoning, however, simply confuses the question of liability with the difficulty of fashioning an appropriate remedy. It may be that an injunction prohibiting the sale of VTRs would harm the interests of copyright holders who have no objection to others making copies of their programs. But such concerns should and would be taken into account in fashioning an appropriate remedy once liability has been found. Remedies may well be available that would not interfere with authorized time-shifting at all. The Court of Appeals mentioned the possibility of a royalty payment that would allow VTR sales and time-shifting to continue unabated, and the parties may be able to devise other narrowly tailored remedies. Sony may be able, for example, to build a VTR that enables broadcasters to scramble the signal of individual programs and "jam" the unauthorized recording of them. Even were an appropriate remedy not available at this time, the Court should not misconstrue copyright holders' rights in a manner that prevents enforcement of them when, through development of better techniques, an appropriate remedy becomes available.[illegible]

[illegible] Even if concern with remedy were appropriate at the liability stage, the Court's use of the District Court's findings is somewhat cavalier. The Court relies heavily on testimony by representatives of professional sports leagues to the effect that they have no objection to VTR recording. The Court never states, however, whether the sports leagues are copyright holders, and if so, whether they have exclusive copyrights to sports broad-

The Court's second stated reason for finding that Sony is not liable for contributory infringement is its conclusion that even unauthorized time-shifting is fair use. *Ante*, at 28. This conclusion is even more troubling. The Court begins by suggesting that the fair use doctrine operates as a general "equitable rule of reason." That interpretation mis-haracterizes the doctrine, and simply ignores the language of the statute. Section 107 establishes the fair use doctrine "for purposes such as criticism, comment, news reporting, teaching, . . . scholarship, or research." These are all productive uses. It is true that the legislative history states repeatedly that the doctrine must be applied flexibly on a case-by-case basis, but those references were only in the context of productive uses. Such a limitation on fair use comports with its purpose, which is to facilitate the creation of new

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casts. Of course, one who does not hold an exclusive copyright does not have authority to consent to copying.

Assuming that the various sports leagues do have exclusive copyrights in some of their broadcasts, the amount of authorized time-shifting still would not be overwhelming. Sony's own survey indicated that only 7.3 percent of all Betamax use is to record sports events of all kinds. Def. Exh. OT, Table 20. Because Sony's witnesses did not represent all forms of sports events, moreover, this figure provides only a tenuous basis for this Court to engage in fact-finding of its own.

The only witness at trial who was clearly an exclusive copyright owner and who expressed no objection to unauthorized time-shifting was the owner of the copyright in *Mister Rogers' Neighborhood*. But the Court cites no evidence in the record to the effect that anyone makes VTR copies of that program. The simple fact is that the District Court made no findings on the amount of authorized time-shifting that takes place. The Court seems to recognize this gap in its reasoning, and phrases its argument as a hypothetical. The Court states: "*If* there are millions of owners of VTR's who make copies of televised sports events, religious broadcasts, and educational programs such as *Mister Rogers' Neighborhood*, and *if* the proprietors of those programs welcome the practice," the sale of VTR's "should not be stifled" in order to protect respondent's copyrights. *Ante*, at 26 (emphasis supplied). Given that the Court seems to recognize that its argument depends on findings that have not been made, it seems that a remand is inescapable.

works. There is no indication that the fair use doctrine has any application for purely personal consumption on the scale involved in this case,[46] and the Court's application of it here deprives fair use of the major cohesive force that has guided evolution of the doctrine in the past.

Having bypassed the initial hurdle for establishing that a use is fair, the Court then purports to apply to time-shifting the four factors explicitly stated in the statute. The first is "the purpose and character of the use, including whether such use is of a commercial nature or is for nonprofit educational purposes." § 107(1). The Court confidently describes time-shifting as a noncommercial, nonprofit activity. It is clear, however, that personal use of programs that have been copied without permission is not what § 107(1) protects. The intent of the section is to encourage users to engage in activities the primary benefit of which accrues to others. Time-shifting involves no such humanitarian impulse. It is likewise something of a mischaracterization of time-shifting to describe it as noncommercial in the sense that that term is used in the statute. As one commentator has observed, time-shifting is noncommercial in the same sense that stealing jewelry and wearing it—instead of reselling it—is noncommercial.[47] Purely consumptive uses are certainly not what the fair use doctrine was designed to protect, and the awkwardness of applying the statutory language to time-shifting only makes clearer that fair use was designed to protect only uses that are productive.

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[46] As has been explained, some uses of time-shifting, such as copying an old newspaper clipping for a friend, are fair use because of their *de minimis* effect on the copyright holder. The scale of copying involved in this case, of course, is of an entirely different magnitude, precluding application of such an exception.

[47] Home Recording of Copyrighted Works: Hearing before Subcomm. on Courts, Civil Liberties and the Administration of Justice of the House Comm. on the Judiciary, 97th Cong., 2d Sess., pt. 2, p. 1250 (1982) (memorandum of Prof. Laurence H. Tribe).

The next two statutory factors are all but ignored by the Court—though certainly not because they have no applicability. The second factor—"the nature of the copyrighted work"—strongly supports the view that time-shifting is an infringing use. The rationale guiding application of this factor is that certain types of works, typically those involving "more of diligence than of originality or inventiveness," *New York Times Co.* v. *Roxbury Data Interface, Inc.*, 434 F. Supp. 217, 221 (NJ 1977), require less copyright protection than other original works. Thus, for example, informational works, such as news reports, that readily lend themselves to productive use by others, are less protected than creative works of entertainment. Sony's own surveys indicate that entertainment shows account for more than 80 percent of the programs recorded by Betamax owners.[*]

The third statutory factor—"the amount and substantiality of the portion used"—is even more devastating to the Court's interpretation. It is undisputed that virtually all VTR owners record entire works, see 480 F. Supp., at 454, thereby creating an exact substitute for the copyrighted original. Fair use is intended to allow individuals engaged in productive uses to copy small portions of original works that will facilitate their own productive endeavors. Time-shifting bears no resemblance to such activity, and the complete duplication that it involves might alone be sufficient to preclude a finding of fair use. It is little wonder that the Court has chosen to ignore this statutory factor.[*]

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[*] See A Survey of Betamax Owners, R. 2353, Def. Exh. OT, Table 20, cited in Brief for Respondents 52.

[*] The Court's one oblique acknowledgement of this third factor, *ante*, at 29, seems to suggest that the fact that time-shifting involves copying complete works is not very significant because the viewers already have been asked to watch the initial broadcast free. This suggestion misses the point. As has been noted, a book borrowed from a public library may not be copied any more freely than one that has been purchased. An invitation to view a showing is completely different from an invitation to copy a copyrighted work.

The fourth factor requires an evaluation of "the effect of the use upon the potential market for or value of the copyrighted work." This is the factor upon which the Court focuses, but once again, the Court has misread the statute. As mentioned above, the statute requires a court to consider the effect of the use on the *potential* market for the copyrighted work. The Court has struggled mightily to show that VTR use has not *reduced* the value of the Studios' copyrighted works in their *present* markets. Even if true, that showing only begins the proper inquiry. The development of the VTR has created a new market for the works produced by the Studios. That market consists of those persons who desire to view television programs at times other than when they are broadcast, and who therefore purchase VTR recorders to enable them to time-shift.[39] Because time-shifting of the Studios' copyrighted works involves the copying of them, however, the Studios are entitled to share in the benefits of that new market. Those benefits currently go to Sony through Betamax sales. Respondents therefore can show harm from VTR use simply by showing that the value of their copyrights would *increase* if they were compensated for the copies that are used in the new market. The existence of this effect is self-evident.

Because of the Court's conclusion concerning the legality of time-shifting, it never addresses the amount of noninfringing use that a manufacturer must show to absolve itself from liability as a contributory infringer. Thus, it is difficult to discuss how the Court's test for contributory infringement would operate in practice under a proper analysis of time-shifting. One aspect of the test as it is formulated by the

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[39] The Court implicitly has recognized that this market is very significant. The central concern underlying the Court's entire opinion is that there is a large audience who would like very much to be able to view programs at times other than when they are broadcast. *Ante*, at 26. The Court simply misses the implication of its own concerns.

Court, however, particularly deserves comment. The Court explains that a manufacturer of a product is not liable for contributory infringement as long as the product is "*capable* of substantial noninfringing uses." *Ante*, at 22 (emphasis supplied). Such a definition essentially eviscerates the concept of contributory infringement. Only the most unimaginative manufacturer would be unable to demonstrate that a image-duplicating product is "capable" of substantial noninfringing uses. Surely Congress desired to prevent the sale of products that are used almost exclusively to infringe copyrights; the fact that noninfringing uses exist presumably would have little bearing on that desire.

More importantly, the rationale for the Court's narrow standard of contributory infringment reveals that, once again, the Court has confused the issue of liability with that of remedy. The Court finds that a narrow definition of contributory infringement is necessary in order to protect "the rights of others freely to engage in substantially unrelated areas of commerce." *Ante*, at 22. But application of the contributory infringement doctrine implicates such rights only if the remedy attendant upon a finding of liability were an injunction against the manufacture of the product in question. The issue of an appropriate remedy is not before the Court at this time, but it seems likely that a broad injunction is not the remedy that would be ordered. It is unfortunate that the Court has allowed its concern over a remedy to infect its analysis of liability.

VII

The Court of Appeals, having found Sony liable, remanded for the District Court to consider the propriety of injunctive or other relief. Because of my conclusion as to the issue of liability, I, too, would not decide here what remedy would be appropriate if liability were found. I concur, however, in the Court of Appeals' suggestion that an award of damages, or continuing royalties, or even some form of limited injunction, may well be an appropriate means of balancing the equities in this case.[83] Although I express no view on the merits of any particular proposal, I am certain that, if Sony were found liable in this case, the District Court would be able to fashion appropriate relief. The District Court might conclude, of course, that a continuing royalty or other equitable relief is not feasible. The Studios then would be relegated to statutory damages for proved instances of infringement. But the difficulty of fashioning relief, and the possibility that complete relief may be unavailable, should not affect our interpretation of the statute.

Like so many other problems created by the interaction of copyright law with a new technology, "[t]here can be no really satisfactory solution to the problem presented here, until Congress acts." *Twentieth Century Music Corp.* v. *Aiken*, 422 U. S., at 167 (dissenting opinion). But in the absence of a congressional solution, courts cannot avoid difficult problems by refusing to apply the law. We must "take the Copyright Act . . . as we find it," *Fortnightly Corp.* v. *United Artists*, 392 U. S. 390, 401–402 (1968), and "do as little damage as possible to traditional copyright principles . . . until the Congress legislates." *Id.*, at 404 (dissenting opinion).

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[83] Other Nations have imposed royalties on the manufacturers of products used to infringe copyright. See, *e. g.*, Copyright Laws and Treaties of the World (UNESCO/BNA 1982) (English translation), reprinting Federal Act On Copyright in Works of Literature and Art and on Related Rights (Austria), § 42(5)-(7), and An Act dealing with Copyright and Related Rights (Federal Republic of Germany), Art. 53(5). A study produced for the Commission of European Communities has recommended that these requirements "serve as a pattern" for the European community. A. Dietz, Copyright Law in the European Community 135 (1978). While these royalty systems ordinarily depend on the existence of authors' collecting societies, see *id.*, at 119, 136, such collecting societies are a familiar part of our copyright law. See generally *Broadcast Music, Inc.* v. *Columbia Broadcasting System, Inc.*, 441 U. S. 1, 4-5 (1979). Fashioning relief of this sort, of course, might require bringing other copyright owners into court through certification of a class or otherwise.

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9/84

COPYRIGHT LITIGATION/NEW TECHNOLOGY

SELECTED CASELIST (1976 COPYRIGHT ACT)

I. PHOTOCOPYING

1. *Addison-Wesley Pub. Co. v. New York University*, 82 CIV. 8333 (S.D.N.Y.). Complaint filed December 14, 1982. Suit against university, eight of its faculty and commercial copy center for photocopying and anthologizing. Complaint withdrawn per settlement agreement with university and faculty. Consent injunction entered against copy center; CCH Copr. L. Rep. ¶25,544.

2. *Harper & Row v. American Cyanamid Co.*, 81 CIV. 7813 (S.D.N.Y.). Complaint filed December 16, 1981. Suit against corporation for photocopying of journal articles. Complaint withdrawn per settlement agreement.

3. *Harper & Row v. Squibb Corporation*, 82 CIV. 2363 (S.D.N.Y.). Complaint filed April 14, 1982. Same as 2.

4. *Basic Books v. The Gnomon Corporation*, CIV. No. 80-36 (D. Conn.). Complaint filed March 28, 1980. Suit against commercial copy center for photocopying. Consent injunction entered; CCH Copr. L. Rep. ¶25,145.

5. *Harper & Row v. Tyco Copy Service*, No. H80-217 (D. Conn. 1980). Same as 4. Consent injunction entered; CCH Copr. L. Rep. ¶25,230.

6. *Aircraft Technical Pub. v. Cessna Aircraft Corp.*, No. 79-4391 (9th Cir. July 9, 1981). Microfiche cards of copyrighted aircraft manuals infringement; fair use rejected.

II. COMPUTER PROGRAMS

1. *Apple Computer, Inc. v. Franklin Computer Corporation*, 714 F. 2d 1240 (3d Cir. 1983), cert. dismissed 1/4/84. Copyrightability of operating and application systems and object code programs embodied in ROMs in general. Cert. dismissed per settlement agreement.

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2. *Apple Computer Inc. v. Formula International, Inc.*, 725 F. 2d 521 (9th Cir. 1984).
   Same as 1.

3. *Apple Computer, Inc. v. Formula International, Inc.*, ___ F. Supp. ___ (C.D. Cal. 1984) (contempt proceeding).
   17 U.S.C. 117 "essential step" copying privilege not applicable to transfer of extracted operating systems from diskette to ROM.

4. *Hubco Data Products Corp. v. Management Assistance, Inc.*, 219 U.S.P.Q. 450 (D. Idaho 1983).
   Copyrightability of object code.

5. *GCA Corp. v. Chance*, 217 U.S.P.Q. 718 (N.D. Cal. 1982).
   Source code only was registered; *held* object code protected as well on theory object code was encryption of source code.

6. *Midway Mfg. Co. v. Strohon*, 564 F. Supp. 741 (N.D. Ill. 1983).
   Infringement of computer program underlying electronic audiovisual game.

7. *Freedman v. Select Information Systems*, 221 U.S.P.Q. 848 (N.D. Cal. 1983).
   Prima facie effect of registration supports preliminary injunction in software case notwithstanding questions of originality and ownership.

8. *Tandy Corp. v. Personal Micro Computers*, 524 F. Supp. 171 (N.D. Cal. 1981).
   ROM as an infringing "copy."

9. *American Intelligent Machines Corp. v. Basic Computers, Inc.*, CCH Copr. L. Rep. ¶25,322 (E.D. Va. 1981).
   Consent judgment prohibiting reproduction, distribution and sale of program.

10. *Williams Electronics,Inc. v. Artic International*, 685 F. 2d 870 (3rd Cir. 1982).
    Chip duplication as "copy" within definitional provisions.

11. *Midway Mfg. Co. v. Artic International*, 704 F. 2d 1009 (7th Cir. 1983), cert. denied 10/3/83.
    Infringement of audiovisual display and underlying computer program.

12. *Peachtree Software Inc. v. United Computer Corp.*, C-83-2082A (N.D. Ga.). Complaint filed 1983.
    Suit to enjoin rental of licensed software.

13. *MicroPro International Corp. v. United Computer Corp.*, C-83-3019 (N.D. Cal.). Complaint filed June 17, 1983. Dismissed per settlement. Same as 12.

14. Atari, Inc. v. JS&A Group, Inc., CCH Copr. L. Rep. ¶25,613 (N.D. Ill. 1983), appeal to Court of Appeals for Federal Circuit filed; jurisdiction questioned. 17 U.S.C. 117 "archival copying" privilege not applicable to ROM-based programs at issue.

15. In Re Certain Personal Computers & Components Thereof, U.S.I.T.C. Inv. No. 337-TA-140 (Initial Determination, Dec. 9, 1983; Final Determination, March 4, 1984; Notice of Issuance of Exclusion Order, March 9, 1984). See CCH Copr. L. Rep. ¶25,651. Determination of substantial similarity. Exclusion order against importation of copyright infringing computer programs and ROM-less computers designed and intended to receive infringing computer components. Compare Dept. of the Treasury, U.S. Customs Service Ruling COP-2-03 CO:R:E:E 724225 RP (ROM-less computers may not be denied entry into U.S. on theory of contributory copyright infringement because 17 U.S.C. 602(b) bars only piratical copies).

16. S&H Computer Systems, Inc. v. SAS Institute Inc., 568 F. Supp. 416 (M.D. Tenn. 1983). Program produced under partial government funding in public domain under terms of grant; discussion of substantial similarity of computer programs.

17. Videotronics, Inc. v. Bend Electronics, 586 F. Supp. 1471 (D. Nev. 1983) preemption of trade secret misappropriation claims involving computer programs; 586 F. Supp. 478 (D. Nev. 1984) letter "C" surrounded by hexagonal shape sufficient in form; random appearance of notice (once every 5-10 games and when reset pushed) insufficient; insufficient effort to cure omission. See also Kramer v. Andrews, 83-1344-3 (D. So. Car. May 29, 1984), appeal filed.

18. Micro-Sparc., Inc. v. Amtype Corp., Civ. No. 84-1043-G (D. Mass. August 31, 1984). 17 U.S.C. 117 "backup" and "archival" copying privileges not applicable to commercial service selling diskette format of programs published in computer magazine.

19. Digidyne Corp. v. Data General Corp., 81-4628, 4667, 4671 & 4162 (9th Cir., June 7, 1984). Data General's refusal to license operating system software except to purchasers of its CPUs held unlawful tying arrangement under Sherman & Clayton Acts. Copyright in operating system found to create presumption of sufficient economic power to render arrangement illegal per se. Trial court's comment suggesting doubt as to coprightability of object code considered no longer tenable.

III. ELECTRONIC DATA BASES

See *Rand McNally & Co. v. Fleet Mgt. Systems, Inc.*, CCH Copr. L. Rep. ¶25,692 (N.D. Ill. July 25, 1984). Computer input of conventional work infringement. *Cf*. also following compilation cases:

Eckes v. Card Prices Update, 736 F. 2d 859 (2d Cir. 1984). Compilation of baseball cards protectible based on subjective selectivity involved.

Rockford Map Publishers, Inc. v. Directory Service Co. of Colorado, Inc., 83-2523 (C.D. Ill. June 14, 1984). Compilation of landowner information. "Industriousness" standard of protection and infringement.

Hutchinson Tel. Co. v. Fronteer Directory Co. of Minnesota, Inc., 586 F. Supp. 911 (D. Minn. 1984), appeal filed. White pages of telephone directory held not an original work of authorship since publication required by state law.

Financial Information, Inc. v. Moody's Investors Service, Inc., CCH Copr. L. Rep. ¶25,534 (S.D.N.Y. 1983); ¶25,617 (S.D.N.Y. 1984).
Compilation of daily bond cards; fair use.

Dow Jones & Co. v. Board of Trade of City of Chicago, 546 F. Supp. 113 (S.D.N.Y. 1982).
Compilation of stock market indexes.

National Business Lists, Inc. v. Dun & Bradstreet, Inc., 552 F. Supp. 89 (N.D. Ill. 1982).
"Fact" protection in compilation cases may lack "conceptual underpinning" but retains vitality.

Southern Bell Telephone & Telegraph Co. v. Associated Telephone Directory Publishers, CCH Copr. L. Rep. ¶25,573 (N.D. Ga. 1983).
Originality of telephone directory.

'. VIDEO GAMES

1. *Midway Mfg. Co. v. Artic International*, 704 F. 2d 1009 (7th Cir. 1983), cert. den. 10/3/83.
   Infringement of audiovisual display; fixation requirement found satisfied.

2. *Williams Electronics, Inc. v. Artic International*, 685 F. 2d 870 (3rd Cir. 1982).
   Infringement of audiovisual display and underlying computer program.

3. *Atari, Inc. v. North American Philips Consumer Corp*., 672 F. 2d 607 (7th Cir. 1982), cert. den. 10/4/82.
   Infringement of audiovisual display.

4. Stern Electronics v. Kaufman, 669 F. 2d 852 (2d Cir. 1982).
   Same as 3.

5. Midway Mfg. Co. v. Strohon, 564 F. Supp. 741 (N.D. Ill. 1983).
   Infringement of computer program but no infringement of
   audiovisual display.

6. Midway Mfg. Co. v. Bandai-America, Inc., 564 F. Supp. 125
   (D.N.J. 1982).
   Same as 3.

7. Nintendo of America, Inc. v. Bay Coin Distributors, Inc.,
   CCH Copr. L. Rep. ¶25,409 (E.D.N.Y. 1982).
   Same as 3.

8. Atari, Inc. v. Armenia Ltd., CCH Copr. L. Rep. ¶25,328
   (N.D. Ill. 1981).
   Same as 3.

9. Midway Mfg. Co. v. Dirkschneider, 543 F. Supp. 466 and 215
   U.S.P.Q. 336 (D. Neb. 1981); 571 F. Supp. 282 (D. Neb. 1983).
   Same as 3.

10. Cinematronics v. Noma Enterprises Co. CIV. 81-349 PHX-
    EHC (N.D. Ariz. 1981).
    Same as 3.

11. Atari, Inc. v. Williams, 217 U.S.P.Q. 746 (E.D. Cal. 1981).
    No similarity of expression.

12. Atari, Inc. v. Amusement World, 547 F. Supp. 222 (D.
    Md. 1981). Appeal withdrawn per settlement.
    Same as 11.

13. In Re Certain Coin Operated Audiovisual Games, USITC No. 337-
    TA-87, 214 U.S.P.Q. 217 (1981); USITC No. 337-TA-105,
    216 U.S.P.Q. 1106, 218 U.S.P.Q. 924 (1982) and Bally/
    Midway Mfg. Co. v. USITC, 714 F. 2d 1117 (Fed. Cir. 1983).
    USITC exclusion orders.

14. Bally/Midway Mfg. Co. v. American Postage Machines, Inc.,
    CCH Copr. L. Rep. ¶25,601 (E.D.N.Y. 1983).
    Same as 3; maximum statutory damages for willfulness.

15. Nintendo of America, Inc. v. Elcon Industries, Inc.,
    564 F. Supp. 937 (E.D. Mich. 1982).
    Same as 3; unauthorized publication without notice did
    not invalidate copyright.

16. Videotronics, Inc. v. Bend Electronics, 586 F. Supp. 478
    (D. Nev. 1984); 564 F. Supp. 1471 (D. Nev. 1983). Infringement
    of audiovisual display; insufficiency of notice.

17. *Kramer v. Andrews*, 83-1344-3 (D. So. Car. May 29, 1984), appeal filed. *De minimis* authorship; insufficient notice; insufficient effort to cure omission of notice.

V. SECONDARY TRANSMISSION BY CABLE TELEVISION OPERATORS

1. *American International Productions v. Arlington Telecommunications Corp.*, CIV. No. 82-0706-A (E.D. Va.). Complaint filed July 30, 1982.
   Underpayment of distant signals. Complaint withdrawn per settlement.

2. *Cablevision Systems Development Co. v. MPAA*, CIV. No. 83-1655 (D.D.C.). Complaint for declaratory judgment filed June 8, 1983; counterclaim for infringement filed June 17, 1983
   Statutory royalties and tiering. Pending.

3. *NCTA v. Columbia Pictures, Inc.*, CIV. No. 83-2785 (D.D.C.). Complaint for declaratory judgment filed September 21, 1983.
   Statutory royalties and mixed service. Pending.

4. Cf. *Orth-O-Vision, Inc. v. Home Box Office*, 474 F. Supp. 672 (S.D.N.Y. 1979).
   Unauthorized retransmission of programs constituted an infringing performance.

VI. SECONDARY TRANSMISSION BY CARRIERS

1. *WGN Continental Broadcasting Co. v. United Video, Inc.*, 685 F. 2d 218; reh. den. 693 F. 2d 622 (7th Cir. 1982).
   Stripping of VBI teletext held infringement under the circumstances.

2. *Eastern Microwave, Inc. v. Doubleday Sports, Inc.*, 691 F. 2d 125 (2d Cir. 1982), cert. den. February 22, 1982.
   Passive retransmission defense sustained.

VII. CABLE TELEVISION INTERCEPTION

1. *Manhattan Cable Television Inc. v. Brandes*, 83 CIV. No. 6270 (S.D.N.Y.). Complaint filed August 23, 1983.
   (Suit against 33 non-subscribing individuals for descrambling, intercepting and receiving cable program service.

2. *Manhattan Cable Television Inc. v. Swells Restaurant*, 83 CIV. No. 6271 (S.D.N.Y.). Complaint filed August 23, 1983.
   (Same as 1., except filed against two restaurants.)

VIII. OFF-AIR RECORDING

1. Sony Corp. of America v. Universal City Studios, Inc., 104 S. Ct. 774, reh'g denied, 104 S. Ct. 1619 (1984). Sale of video tape recorders to general public does not constitute contributory infringement on factual record because they are capable of "commercially significant" non-infringing use; and private, home off-air "time shifting" of free-broadcast television programs held fair use.

2. Bruzzone v. Miller Brewing Co., 202 U.S.P.Q. 809 (N.D. Cal. 1979).
Market researcher's off-air taping and analysis of television advertisements held fair use.

3. New Boston Television v. ESPN, 215 U.S.P.Q. 755 (D. Mass. 1981).
Off-air taping and retransmission of portions of professional sports games held not fair use

4. Pacific & Southern Co. v. Duncan, 220 U.S.P.Q. 859 (N.D. Ga. 1982) and 572 F. Supp. 1186 (N.D. Ga. 1983).
Cross motions for summary judgment denied where commercial news clipping service taped off-air and then sold 45-second feature news program. Post-trial decision holding against fair use (but permanent injunction denied).

5. Encyclopaedia Britannica Educational Corp. v. Crooks, 447 F. Supp. 243 (W.D.N.Y. 1978); 542 F. Supp. 1156 (W.D.N.Y. 1982); 558 F. Supp. 1247 (W.D.N.Y. 1983) (prior law).
Large-scale educational off-air taping held not fair use.

IX. SATELLITE INTERCEPTION

1. National Football League v. American Embassy, Inc., 83-701-CIV (S.D.N.Y. September 16, 1983).
Interceptions of blacked-out football games by bars using earth stations and performance of same by closed-circuit television to patrons held infringement; injunction granted.

X. PERFORMANCE FROM VIDEO CASSETTES

1. Columbia Pictures Industries, Inc. v. Redd Horne, Inc., 568 F. Supp. 494 (W.D. Pa. July 28, 1983).
Rental of video cassettes for on-premises showing to limited group violated "public" performance right.

2. Columbia Pictures, Inc. v. State of Wisconsin, CIV. No.____ Complaint filed August 18, 1983 (E.D. Wisc.)
(Showing of video cassettes to prison inmates via closed circuit television alleged as infringement of public performance right.)

3. California Attorney General Opinion No. 81-503 February 5, 1982 CCH Copr. L. Rep. ¶25,368.
Opinion that showing of video cassettes to prison inmates would violate copyright owner's right of public performance.

4. Paramount Pictures Corp. v. Sullivan, 546 F. Supp. 397 (D. Maine 1982).
Restaurant owners enjoined from publicly showing video cassettes of motion pictures.

98TH CONGRESS
2d Session | HOUSE OF REPRESENTATIVES | REPORT
98-781

SEMICONDUCTOR CHIP PROTECTION ACT OF 1984

MAY 15, 1984.—Committed to the Committee of the Whole House on the State of the Union and ordered to be printed

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Mr. KASTENMEIER, from the Committee on the Judiciary, submitted the following

REPORT

[To accompany H.R. 5525]

[Including cost estimate of the Congressional Budget Office]

The Committee on the Judiciary, to whom was referred the bill (H.R. 5525) to amend title 17, United States Code, to protect mask works of semiconductor chips against unauthorized duplication, and for other purposes, having considered the same, report, by voice vote, a quorum being present, no objection being heard, favorably thereon with amendments and recommend that the bill as amended do pass.

The amendments are shown in the reported bill, with the matter proposed to be stricken shown in linetype and the matter proposed to be inserted shown in italic type.

PURPOSE OF THE LEGISLATION

The purpose of the legislation is to protect semiconductor chip products in such a manner as to reward creativity, encourage innovation, research and investment in the semiconductor industry, prevent piracy, while at the same time protecting the public.

BACKGROUND

In about 500 B.C., the Greek philospher Heraclitus observed that "nothing endures but change." More recently, a noted legal historian has noted: "Change is one of the few things men can be certain of."[1] The proof of these statements is their truth today. In our age, however, technology has accelerated the pace of change far beyond what anyone might have dreamed. It is easy to forget that the movie industry is only about seventy years old; the television industry is reaching its fourth decade; and the semiconductor industry is in comparison a mere infant.[2] The information society—no longer an idea, but reality today—had its origins in 1956–1959.[3]

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[1] W. Hurst, *The Growth of American Law: The Law Makers* 19 (1950).

Integrated circuits, better known as semiconductor chips, have revolutionized our entire way of life. Semiconductor chips are used to operate microwave ovens, cash registers, personal and business computers, TV sets, refrigerators, hi-fi equipment, automobile engine controls, automatic machine tools, robots, printing presses, cardiac monitors and pacemakers, X-ray imaging and scanning equipment, blood testing equipment, word processors and printers, telephones, and many other medical, consumer, business, and industrial products. New and better uses for chips are emerging regularly and society is rewarded with a corresponding enhancement of life. More than perhaps any other invention, the semiconductor chip has brought us into the information age.

The fundamental shift from an industrial to an informational society is no longer just a prediction but is a reality. The majority of the American workforce is engaged not in the production of goods but in the creation, processing and distribution of information. Expanding information technology, from computers to satellites, from television to teletype, ensures that we will become even more of an information society in the future. The semiconductor chip is at the vortex of this new society.

A semiconductor chip is typically much smaller than a fingernail. Yet a single chip may contain over 100,000 transistors photographically etched and deposited on a silicon wafer.[4] Fitting these transistors into that small space, placing them so that the resulting device operates efficiently and economically, is a fine art and also a costly one. The layout/design process and the preparation of the photographic "mask" used to etch, deposit layers on, and otherwise process the chip often take the innovating chip firm years, consume thousands of hours of engineer and technician time, and cost millions of dollars. The development costs for a single new chip can reach $100 million.

NATURE OF THE PROBLEM

A competing firm can photograph a chip and its layers, and in several months and for a cost of less than $50,000 duplicate the mask work of the innovating firm. Because the copyist firm does not have the enormous costs borne by the innovator, such a firm can undersell the innovating firm and flood the market with cheap copies of the semiconductor chip. In an industry in which innovation is absolutely essential, such appropriation of creativity is a devastating disincentive to innovating research and development. The prices charged by an innovating firm necessarily must reflect the research and development costs of the innovating chip. Once returns on investment have been choked off by the unfair competition of competing firms which do not bear the tremendous research and development costs, the incentive for innovating firms to set aside internal funds for the development of future generations of semiconductor products is severely limited. Moreover, the disincentive effect reaches other firms who learn a lesson from the misfortune of others. Such copying is a clear threat to the economic health of the semiconductor industry. This, of course, has a ripple effect throughout the country's economy, with the impact becoming ever more critical as we continue an accelerated transition to a high-tech society.

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[2] The first semiconductor chip was invented in 1959 simultaneously by Jack Kilby and Robert Noyce; the microprocessor chip was invented in 1971 by Ted Hoff. See generally T. Wolfe, The Tinkerings of Robert Noyce, Esquire (December 1983) at 346.

For further information about the role of law and societal change, see Hearings on Copyright and Technolgical Change Before the House Judiciary Subcommittee on Courts, Civil Liberties and the Administration of Justice, 98th Cong., 1st sess. (1983) [hereinafter referred to as House Hearings on Copyright and Technological Change].

[3] J. Naisbitt, *Megatrends* 11 (1982).

[4] For an excellent article on the chip, see "Electronic Mini-Marvel That Is Changing Your Life: The Chip", National Geographic, Vol. 162, No. 4 (October 1982) at 421.

To allow the continuation of present practice may make it increasingly difficult for the semiconductor industry to continue to invest in development of new chips.

Parenthetically, U.S. semiconductor products compete successfully on international markets precisely because they are, on the whole, the best and most innovative products available.[5] U.S. semiconductor manufacturers have achieved this because they have long stressed the development of innovative products and have utilized pricing structures enabling that development to take place.[6]

Unless changes in the law occur, conferring some protection on semiconductor chip products, the industrial leadership enjoyed in the past by the American semiconductor industry may vanish. Ultimately, the continued viability of the information society may be threatened.

Current intellectual property law offers innovating chip firms only limited protection against the misappropriation of their technology. The current copyright, patent and trademark laws give little, if any, protection to semiconductor chips.[7] Patent law can protect the basic electronic circuitry for new microprocessors or other new such products. But patent law does not protect the particular layouts and design work performed by the different chip manufacturers in adapting those electronic circuits for a particular industrial purpose, because the creativity involved does not rise to the inventive level required by the patent laws. Yet, it is those layouts and design works that consume the resources of the innovating firms and that are copied by free riders.[8] Copyright law has always considered a mask work to be purely utilitarian, and therefore outside the scope of copyright protection.

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[5] The economic state of an industry, and pricing mechanisms that might be used in lieu of legislation, are important policy subjects for Congress. Here, a finding that an industry has done well in the past without legislative protection does not mean that threats to present and future investments fall outside Congressional concern.

[6] Historically, semiconductor chip prices decline 28 to 30 percent each time total output doubles. Noyce, "Microelectronics" in *Microelectronics* (W. H. Freemen & Co.) 2, 7–8 (1977).

[7] See Hearings on Copyright Protection for Semiconductor Chips Before the House Judiciary Subcommittee on Courts, Civil Liberties and the Administration of Justice, 98th Cong., 1st sess. (1983) [hereinafter referred to as House Hearings (1983)] (statements of Hon. Don Edwards, Hon. Norman Y. Mineta, and Hon. Charles McC. Mathias).

[8] As aptly observed by the Commissioner of Patents and Trademarks: "Patent protection is available for the process of making the chip, for the electronic circuit embodied in the chip itself as an article of manufacture, provided that the process or the circuit or the article of manufacture meets the patentability requirements of being new, useful and unobvious. While a patent on the circuit would protect against the manufacture, use or sale of the circuit, the circuits in chips are usually well-known and therefore unpatentable. Patents for the process of making the chip or for the chip itself as an article of manufacture would not ordinarily protect against a taking of the design." Id. at 17 (Statement of Gerald J. Mossinghoff).

Morever, as the Copyright Office has observed:

> * * * copyright does not protect useful articles per se; copyright protects the design of a useful article only to the extent that artistic features can be identified separately from, and are capable of existing independently of, the utilitarian aspects of the article copyright in a drawing or other representation of a useful article does not protect against unauthorised duplication of the useful article; and copyright protects only expression—not ideas, plans, or processes. (Footnotes deleted.)[9]

Current law needs to be changed to help innovating firms combat unfair chip copying. It needs to be changed to allow innovating firms the necessary incentive to continue to invest in research and development, by protecting them against the piracy of the results of that research and development. Most importantly, it needs to be changed to enable the public to benefit from the labors of creators. It is abundantly clear to the Committee that the best way to change current law is by adding a new, freestanding and unitary chapter 9 to title 17 of the United States Code. Protection of semiconductor chip products by a sui generis approach, rather than through extension of the Copyright Act to admittedly utilitarian objects, carries with it a number of benefits in addition to providing requisite protection. These benefits shall be set forth below under separate discussions of the Congressional role, international ramifications, and sui generis versus copyright protection.

THE CONGRESSIONAL ROLE

It is clearly within the power of Congress to modify or amend this nation's intellectual property laws. Article I, Section 8 of the Constitution provides that:

> The Congress shall have Power * * * to Promote the Progress of Science and useful Arts, by securing for limited Times to Authors and Inventors the exclusive Right to their respective Writings and Discoveries.

The monopoly privileges that Congress may confer " * * * are neither unlimited nor primarily designed to provide a special private benefit. Rather, the limited grant is a means by which an important public purpose may be achieved." *Sony Corp.* v. *Universal City Studios, Inc.*, 104 S. Ct. 774 (1984); *accord, United States* v. *Masonite Corp.*, 316 U.S. 265, 278 (1942) (same as to patents).

The congressional role therefore—as is made very clear in the text of the Constitution—is to define the scope of the limited monopoly that should be granted a creator in order to give the public appropriate access to a creation. Balancing between the rights of the creator and the needs of the public clearly is necessary. In fact, where changes have occurred and new technologies have been developed, Congress consistently has engaged in precisely such a balancing approach.

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[9] Id. at 85–86 (Statement of Dorothy Schrader).

When creating new intellectual property rights or in expanding old rights, legislators must therefore weigh the relative equities between the rights of the property holders and the interests of the public. Where technological changes have occurred, and those changes have had an impact on the lives of millions of people (as is the case for semiconductor chips), Congress must be extremely careful that its approach be reasonable and workable.

In so doing, it is important to keep in mind the following admonition:

> * * * Copyright is an amalgam of property law principles bent to the service of a rather simple bargain. A limited term of protection against copying is granted to an author's original expression in exchange for the dedication of that expression to the public domain at the end of the term. The public ordinarily benefits at least twice from this bargain: once, when the original expression is first created, and then again when the expression is added to the public domain from which anyone may borrow freely to fashion new works. Although a copyright belongs to an author during its term, the ultimate purpose of this bargain is not to protect authors but rather to enrich the public domain. The cardinal principle in copyright law, then, is that any decision to extend the law or to recognize new interests ought to be based on a realistic expectation that one day the public domain will bear new fruit.[10]

The "Semiconductor Chip Protection Act of 1984," which of course does recognize new interests, is grounded in the expectation that one day the public domain will bear mature fruit. Further, H.R. 5525 navigates the sometimes troubled waters between "* * * the interests of authors and inventors in the control and exploitation of their writings and discoveries on the one hand, and society's competing interest in the free flow of ideas, information, and commerce on the other hand," *Sony Corp.* v. *Universal City Studios, Inc.*, supra 104 S. Ct. at 782.

SUI GENERIS VERSUS COPYRIGHT APPROACH

Congress, in exercising its constitutional authority to solve problems discussed above, is faced with a choice between two approaches: copyright protection or sui generis protection. In the opinion of the Committee (without dissent), protection for mask works should be granted apart form the Copyright Act; H.R. 5525 therefore creates a new form of legal protection separate from and independent of the Copyright Act, as contained in Chapters 1 through 8 of title 17 of the United States Code. In reaching this conclusion, the Committee gave careful consideration to the relative merits of protecting mask works under copyright.[11]

From a Congressional perspective, the unique problems posed by the need to reward creativity, encourage innovation, research and investment in the semiconductor industry while at the same time protecting the interests of the public has called for unique solutions. The approach taken in H.R. 5525, the creation of a sui generis form of protection, reflects the Committee's judgment that such an approach is uniquely suited to the protection of mask works, which represent a form of industrial intellectual property. This is to be contrasted with the so-called "author's copyright" in literary and artistic works protected under traditional copyright principles. The Committee is aware that copyright has expanded to encompass new forms of protection, many of which have commercial applications. The commercial application or character of a given copyrighted work, however, presents a far different case from that of mask works, which are intended to be and are used as part of an integral part of a manufacturing process. This manufacturing purpose and use is, in fact, the reason for the Copyright Office's refusal to accept chip products for deposit as "copies" of "pictorial graphic or sculptural works" under the Copyright Act.[12]

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[10] See Hearings on Copyright and Technological Change, supra note 2, at 60 (statement of Professor David Lange).

[11] Both H.R. 1028, 98th Cong., 1st sess. (1983), and S. 1201, 98th Cong., 1st sess. (1983), protect mask works under copyright.

The Committee's position is perhaps best expressed by the following statement of Professor L. Ray Patterson (Emory University School of Law):

> The ultimate issue is the problem of integrity in the law of copyright. By integrity, I mean consistency in the principles which the law encompasses. While consistency for its own sake is a virtue of small consequence, consistent principles for a body of law are essential for integrity in the interpretation and administration of that law.
>
> The conclusions to which I have come are two: (1) It would be unwise for Congress to provide copyright protection for semiconductor chips by amendment to the present statute. The basis for this conclusion is that the present copyright statute purports to provide for an author's copyright. (2) The appropriate solution to the problem of protection for semiconductor chips is the creation of an industrial copyright, separate and distinct from the author's copyright.[13]

Stated somewhat differently, a mask work is not a book. The proposed legislation does not engage in the legal "fiction" of treating books and mask works similarly. It does not suffer from the "fallacy of analogy" referred to by Judge Stephen Breyer in his remarks to the recent Congressional Copyright and Technology Symposium.[14]

There is no reason for believing that a sui generis approach will provide any less encouragement or stability within the field of semiconductor chip design, since the essential attributes of H.R. 5525 (e.g., ten-year term of protection, limitations on innocent infringers, liability, and a reverse engineering right) are identical or substantially similar to those contained in bills conferring protection under copyright.

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[12] See *Intel Corp. v. Ringer* (C 77-2848 N.D. Cal. 1978, voluntary dismissal of complaint). See discussion at notes 20-21, infra, and accompanying text.

[13] See Hearings (1983), supra note 7, at 54. See also written statements of Professor Robert C. Denicola, Professor Alan Latman, Professor John Kidwell, and Michael A. Lechter, Esq., supra note 7.

[14] See also Summary or Rapporteur (Paul Goldstein, Professor of Law, Stanford Law School), Proceedings of Congressional Copyright and Technology Symposium, 4-6 February 1984, Fort Lauderdale, Florida. As observed by Judge Breyer: "The analogy that grips Congress' attention will be the one that controls it."

The creation of a sui generis form of protection for mask works represents, in the Committee's view, appropriate recognition of the industrial nature of mask work design and avoids conceptual confusion in copyright law to accommodate a form of intellectual property which is better protected by reference to the background and practices of the semiconductor industry.

The arguments asserted in favor of a copyright approach may be summarized in two points: first, the copyright route might allow international protection of mask works under the existing copyright conventions, the Universal Copyright Convention (hereinafter referred to as UCC) to which the United States adheres and the Berne Convention, which we have not joined; and, second, a nearly 200-year body of legal precedents could be tapped to provide more certainty regarding the scope of mask work protection.

International Considerations.—With respect to international protection, the Committee believes that the interest of the United States in establishing a reasonable system of domestic protection for mask works is paramount, especially since the possibility of international protection under the copyright conventions is speculative. There are technical problems in fitting mask work protection under the Universal Copyright Convention—questions concerning what constitutes a "copy," questions concerning publication and its relationship to any requirement of notice of copyright, and questions about whether mask works could be treated as photographs or works of applied art in order to justify the ten year term of protection (since the UCC ordinarily requires a minimum 25-year term). No country has protected mask works under the UCC to date. There is no assurance that any other country would agree with the United States that the functional features of a semiconductor chip can be protected under copyright.

If the United States enacts copyright legislation to protect mask works, we would be required to give equivalent protection under the UCC; arguably we could stand thereafter alone in the obligation to protect works first published in UCC countries or created by UCC nationals. The United States could be required to protect, for example, the mask works of Japan, West Germany, and the Soviet Union, and receive no protection in return. This is required by application of the principle of "national treatment," the fundamental principle of the UCC.[15] A reading of the clear language of the UCC[16] allows the conclusion that the United States could retaliate if other nations refused to protect mask works, although we have never exercised this option previously. Moreover, specific legislation authorizing retaliation would be required;[17] there is not a single bill pending in the 98th Congress that confers copyright protection on mask works and provides for retaliation.

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[15] See Article II (1), UCC.

[16] See Article IV (4), UCC.

[17] The UCC is not a self-executing treaty. See Article X. See also Wasserstrom, "Some Reflections on Article VII, IX, XV, and XX of the Universal Copyright Convention," in *Universal Copyright Convention Analyzed* (Kupferman dnd Foner, New York, 1955) at 63, 67. See also Ringer and Flacks, "Applicability of the Universal Copyright Convention to Certain Works in the Public Domain in their Country of Origin," 27 Bull. Cr. Soc. 157, 199 (1980). Section 104 of 17 U.S.C. would have to be amended.

Accordingly, the Committee concludes that the UCC does not now obligate member countries to protect mask works, and this bill does not attempt to meet the requirements of the UCC. Possibly international protection could be sought through bilateral arrangements (and eventually through a new or revised treaty) that would assure United States nationals of substantially the same amount of mask work protection in foreign countries as the United States grants to foreign nationals. It also is possible that the UCC, or another multilateral treaty, could be amended.

The Committee also believed it important that the Act should be consistent with the General Agreement on Tariffs and Trade (GATT). Therefore, H.R. 5525 treats foreign and domestic infringers on a completely equal basis. Moreover, H.R. 5525 affords full reciprocity to foreign owners of mask works and allows them to secure protection under this Act if their country allows such protection to U.S. owners of mask works.[18]

Copyright Law.—In considering whether the copyright system could provide the best form of domestic protection for mask works, the Committee notes that the present copyright law does not protect useful articles, as such, and semiconductor chip products are useful articles, as defined in the Copyright Act. 17 U.S.C. 101 (definitions of "pictorial, graphic or sculptural works" and "useful article"). Moreover, while masks containing technical information and schematic drawings of chip layouts have been registered under the Copyright Act as technical drawings, the fundamental principle codified in 17 U.S.C. 113 has meant that any protection as a "technical drawing" does not protect the copyright owner of the drawing with respect to unauthorized duplication of the finished useful article represented by the drawing.[19] No court has held that duplication of a semiconductor chip violates any rights in the registered technical drawing.[20] Under 17 U.S.C. 113, no other conclusion seems likely.

The prohibition against copyright in useful articles is a fundamental principle of our copyright laws, adhered to for the nearly 200 years of their existence. In philosophical terms, the prohibition rests on the distinction between protection for expression and nonprotection for ideas under copyright, and on the differences in scope, standards, term, and purpose of the patent and copyright systems. In pragmatic terms, the nonprotection of useful articles that do not meet the patent standards of novelty and invention represents a societal judgment that the public benefits from relatively unhampered imitative copying of non-novel useful articles, unless the conduct is so predatory that it should be curtailed by unfair competition, or perhaps trade secrecy, laws. Other countries have established design protection laws, based on modified copyright and patent principles, to fill some of the gap between copyright and patent protection for designs applied to useful articles. The Congress has rejected this course to date.

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[18] In point of fact, the Office of the Trade Representative, through the White House Cabinet Council on Commerce and Trade, requested a drafting change in section 4(b)(2) of H.R. 5525 to insure fully equal treatment for foreign and domestic manufacturers. This technical change was made.

[19] See *Muller* v. *Triborough Bridge Authority*, 43 F. Supp. 298, 300 (S.D.N.Y. 1942) (bridge not protected copyright in drawing); *Jack Adelman, Inc.* v. *Sonners & Gordon, Inc.*, 112 F. Supp. 187, 190 (S.D.N.Y. 1934) (same for dress design); *Supplemental Report of the Register of Copyrights on the General Revision of the U.S. Copyright Law: 1967 Revision Bill, Copyright Law Revision Part 6*, 47–48 (1965).

[20] *Intel Corp.* v. *Ringer*, C 77-2848 (N.D. Cal., October 10, 1978) sought judicial reversal of the Copyright Office's refusal to register a claim to copyright in a chip product or design based on the contention that the chip is the published copy of a technical drawing. The case was withdrawn by the plaintiff without prejudice.

The artistic features of useful articles can be protected under copyright provided that such features can be identified separately and are capable of independent existence as a work of art, a part from the overall shape of the useful article. 17 U.S.C. 101 (definition of "pictorial, graphic, or sculptural work"); *Mazer* v. *Stein*, 347 U.S. 201 (1954) (Balinese dancer sculpture used as a base for lamp).[21] The overall shape of a useful article has not been protected by copyright, no matter how unique or attractive the design concept. *Esquire, Inc.* v. *Ringer*, 591 F.2d 796 (D.C. Cir. 1978), cert. denied, 440 U.S. 908 (1979) (outdoor lighting fixture not copyrightable); *Eltra Corp.* v. *Ringer*, 579 F.2d 294 (4th Cir. 1978) (typeface design not copyrightable); *Norris Industries* v. *I.T. & T. Corp. and Ladd*, 696 F.2d 918 (11th Cir. 1983), cert. denied, U.S. , October 3, 1983 (design for automobile wire wheel not copyrightable).

A 1979 bill, H.R. 1007 (96th Congress, First session), would have protected designs for semiconductor chips as works of art even though the designs are not separable from and are not independent of the utilitarian aspects. Yet the designs for semiconductor chip products are purely functional features. H.R. 5525 protects the functional aspects of chip design, provided the particular design is neither dictated by a particular electronic function nor is one of only a few available design choices that will accomplish that function.

Notwithstanding the essentially utilitarian nature of chips, at least two bills pending in the 98th Congress place mask works within the mainstream of copyright law.[22] These bills attempt to solve the useful article issues, (1) by creating a new, separate category of copyrightable subject matter ("mask works"), which purportedly would not be subject to the useful article line of copyright cases; and (2) by avoiding use of the term "copy" as applied to semiconductor chips in order to obviate application of the principle of 17 U.S.C. 113. Thus, these bills apply to chip products the provisions of copyright law that apply to "copies", in nine specified enumerated sections of the copyright law, and in no others. This approach—designed to avoid confusion—does not succeed.

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[21] The current Copyright Act's definition of "pictorial, graphic, or sculptural work" essentially codified Copyright Office regulations interpretive of the copyright statutes. Before the Act of 1909, the copyright laws apparently prohibited copyright even in the artistic feature of useful articles; the Act of 1870, for example, used the restrictive term "works of the fine arts." In the 1909 Act, the qualifying term "fine" was dropped; "works of art" was established as a subject matter catetory. The first regulations of the Copyright Office (1910) interpreting the 1909 Act, prohibited registration for "[p]roductions of the industrial arts utilitarian in purpose and character . . . even if artistically made or ornamented." This regulation was superseded in 1948 by a rule defining "works of art" specifically to include "works of artistic craftsmanship, insofar as their form but not their utilitarian aspects are concerned. . . ." [Quoted with approval in *Mazer* v. *Stein*, 347 U.S. 201, 212-213 (1954).] After the *Mazer* decision, the regulation was revised in 1956 and 1959 to articulate more precisely the dividing line between protectable artistic features and nonprotectable aspects of a useful article. The 1959 regulation was codified in the current Act.

[22] See H.R. 1028, 98th Cong., 1st sess. (1983) and S. 1201, 98th Cong., 1st sess. (1983). The Committee, of course, has opted for the approach in H.R. 5525 which was a substitute amendment in subcommittee for H.R. 1028.

The first solution might have been technically feasible, although significant questions arise about the impact of this approach on the principle of separation of artistic features from utilitarian aspects and the consequent dividing line between copyrightable and noncopyrightable features of useful articles.

The second solution raises serious technical questions. If semiconductor chip products are not copies per se, which these bills do not say they are, would publication of the chip product result in publication of the mask work embodied?[23] How would a mask work be published otherwise? (If the mask work is not capable of publication, the notice formality of the copyright law would not apply.) Would confusion arise concerning the status of computer programs and other works embodied in semiconductor chips? Further questions could be asked.

Mask works, although superficially similar in some respects to maps, technical drawings, photographs, or audiovisual works, are in fact very dissimilar in function and nature of creativity. Maps are not useful articles within the meaning of copyright law since they merely convey information. Technical drawings are protected for their drawing aspects and information content, but protection has not extended to manufacture or sale of the useful article portrayed. Photographs and audiovisual works are protected for their visual, aesthetic appeal. They have no intrinsic purpose other than to portray their own appearance. Accordingly, photographs and audiovisual works are not useful articles under copyright law, even if they are used for training or educational purposes, for example. By contrast, mask works would be protected on the basis of the technical and creative skill employed in laying out or designing electronic circuitry. Mask works have no intrinsic aesthetic purpose. Even if the layouts convey information, that is not their sole or main purpose: their primary purpose is to be used in the manufacture of a useful article—semiconductor chip products.

The Committee decided that the formidable philosophical, constitutional, legal and technical problems associated with any attempt to place protection for mask works or semiconductor chip designs under the copyright law could be avoided entirely by creating a sui generis form of protection, apart from and independent of the copyright laws. This new form of legal protection would avoid the possible distortion of the copyright law and would establish a more appropriate and efficacious form of protection for mask works. Rather than risk confusion and uncertainty in, and distortion of, existing copyright law as a result of attempting to modify fundamental copyright principles to suit the unusual nature of chip design, the Committee concludes that a new body of statutory and decisional law should be developed. It should be specifically applicable to mask works alone, and could be based on many copyright principles, and other intellectual property concepts; it could draw by analogy on this statutory and case law framework to the extent clearly applicable to mask works and semiconductor chip protection, but should not be restricted by the limitations of existing copyright law.

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[23] Section 101 of title 17, which defines "publication" is not one of the nine sections included.

TECHNOLOGICAL BACKGROUND

The following discussion provides necessary information about the technology of the semiconductor industry. Any inquiry about copyright and technological change must, of course, start with a basic understanding of technological breadth and pace of change, before turning to the mechanism of protection.[24]

1. THE SEMICONDUCTOR CHIP

A semiconductor material is an element or compound that has the capacity to partially conduct electricity. As its name implies a semiconductor is intermediate between conductors, which fully conduct electricity, and insulators, which do not appreciably conduct electricity. The semiconductor material most often used today is silicon; others are germanium and gallium arsenide.

The "chip," nickname for the integrated circuit, at its simplest is electronic circuitry. A complex of miniscule switches are patterned on the chips' silicon base. These switches, which control the electric current, are joined by "wires" etched from extremely thin films of metal. "Under a microscope the chip's intricate terrain looks uncannily like the streets, plazas, and buildings of a great metropolis, viewed from miles up."[25]

Chips are collections of transistors formed on a single ("integrated") structure which work together to perform assigned electronic functions. The latest generation of chips on the market contain more than 250,000 transistors which are compacted on an area of silicon wafer a quarter inch square. By way of comparison, 5,000 transistors operate a digital watch; 20,000 are used for a pocket calculator; and 100,000 are necessary for a relatively small computer. Today's chips of 250,000 transistors have more computing power, compute faster, consume far less power, are more reliable, and sell at a fraction of the cost than mainframe computers of the early 1970s.[26]

The most advanced semiconductor chips can be broadly classified into two categories: microprocessors and memories. The microprocessor, referred to as a "computer on a chip," has logic circuits capable of electronically performing various information processing functions. It serves as the brains of many of today's electronic equipment. On the other hand, a memory is a semiconductor chip which simply stores certain data. This data could be data upon which the microprocessor will operate. It could also be the output of the microprocessor (that is, data which the microprocessor has already operated on and needs to be saved for future computations). Of course, the functions of a microprocessor and a memory can be integrated on the same semiconductor chip.[27]

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[24] See House Hearings on Copyright and Technological Change, supra, note 2 (statement of Fred W. Weingarten).

[25] National Geographic, supra, note 4, at 421.

[26] See House Hearings (1983), supra, note 7, at 23 (statement of F. Thomas Dunlap, Jr.).

[27] Id.

2. CHIPS AND THEIR CREATION

Several distinct marketing and creative stages are involved in bringing a new semiconductor chip to the market.

At the outset, since a substantial economic investment is required, a market study must be conducted to determine the functions which potential customers would like performed. Physical and electrical characteristics can be preliminarily defined at this early stage.

Once the functions of a chip are defined, it is the job of a circuit design engineer to develop circuits to implement these electronic functions. The circuit engineer develops a circuit by making a "schematic" representation of the manner in which transistors must be connected to implement the appropriate electronic function. Often 20 sheets of paper will be used to draw the entire schematic of a complex chip. The circuit schematic is a paper document and is not useful until it is fabricated on a chip. Next comes the arduous stage of layout determination. A layout design engineer must take the circuit schematic and layout patterns which can be imprinted onto a wafer to form a chip. The goal of the layout process is to decide upon a three-dimensional layout that is composed of a predetermined set of building blocks. The layout must be done in a timely manner so that the final chip can be available in the marketplace when it was needed. More importantly, the layout must be very compact to minimize the cost of the chip. The smaller the chip (the less "silicon real estate" it uses), the more chips which can be put on a single wafer and consequently, the better chance that the wafer will yield more good chips. Trial and error is used to select the optimum layout. Unsurprisingly, the layout stage is time-consuming and extremely costly.[28]

The layout determination process is followed by the actual manufacturing process.

3. MANUFACTURE OF THE SEMICONDUCTOR CHIP

The basic building block of a chip is a transistor, or electronic switch, that controls and amplifies electrical signals. These transistors are connected, or integrated, to form a particular circuit which performs a desired function.

Transistors and chips are formed on a thin semiconductor substrate (typically silicon) which is known as a "wafer." Typically, it is a five-inch diameter disk approximately .025 inches thick. Hundreds of chips will be made at one time by processing a wafer. The wafer will be subjected to certain chemical, photographic, and heat treatments.

The manufacture or fabrication of a chip is as follows:

Semiconductor chip products are most frequently manufactured by a process known as "photolithography" or "masking." After the two and three dimensional features of shape and configuration of a chip have been determined, the layout (or "topography") of the chip can be fixed in pictorial form—a so-called "composite" drawing of the various layers of the chip, shown in different colors on a very large sheet of paper. The same information can be recorded in digital form, by storing all the relevant coordinates of points in the composite drawing in a computer tape known as a "data base tape."

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[28] Id.

This information is then used to generate a series of "masks," which are stencils used to manufacture chips. Chips are manufactured by etching material (or otherwise removing it) away from semiconductor wafers and depositing material (or otherwise placing it) on the wafers. The etching and depositing processes configure the chips to the patterns comprising the mask work protected by this Act. The masks are used to control the etching and depositing processes.

The following steps exemplify the use of masks to configure into silicon the patterns of a mask work. A silicon wafer is coated with a layer of silicon dioxide, which (unlike silicon itself) is soluble in hydrofluoric acid. The silicon dioxide layer is then covered with a thin film of natural or synthetic rubber, known as "resist," because it resists the action of acid. Over the wafer is then placed a stencil, which typcially is a glass mask having opaque and transparent regions that correspond to one of the patterns of the mask work. Ultraviolet light is then cast on the mask. The radiation passes through the transparent parts of the mask but is blocked by the opaque parts. Where the ultraviolet light contacts the resist, the rubber is polymerized or "hardened" and becomes relatively insoluble in organic solvents. As a result, when next the wafer is washed in a solvent, the unhardened parts of the rubber film are dissolved away, while the hardened parts remain, leaving the mask pattern laid out in "resist" on the surface of the wafer. The wafer is then placed in hydrofluoric acid, which dissolves away the silicon dioxide that is not protected by resist. The resist is then removed, and a hill and valley pattern has been etched into the wafer.

The manufacture of a chip usually involves eight to twelve masking steps as described above. Each step uses a different mask. After completion of all masking steps, the originally unconfigured pure silicon wafer has been converted into several hundred chips laid out side by side like postage stamps on a sheet. Typically, each chip is less than ¼ x ¼ inch in size. The chips are multiple layer "sandwiches" of pure silicon, silicon dioxide, and aluminum; and in some places the silicon has been mixed with phosphorous, boron, arsenic, and similar "dopants" which change the electrical conductivity of silicon. (The hundred thousand or more transitors on the face of a chip are each made up of regions of varying conductivity, due to an excess or deficiency of electrons, which effect is caused by the dopants.) The chips are then sawed apart and are wired into ceramic or plastic packages for use in electronic equipment.[29]

The mask work—protected by H.R. 5525—is the two-dimensional and three-dimensional features of shapes, pattern and configuration of the surface of the layers of a semiconductor chip product. In other words, the mask work essentially is the layout determination and the sum total of the individual masks, set upon each other, used to fabricate the entire chip.

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[29] More detailed descriptions of semiconductor chip manufacture are found in National Geographic, supra, note 4, at 426–427, 432–34; *Microelectronics*, W. H. Freeman & Co., supra, note 6. See also House Hearings, supra, note 7 (Statements of F. Thomas Dunlap, Jr., and Dorothy Schrader).

H.R. 5525 is drafted flexibly so as not to freeze into place existing technologies. Semiconductor chip products are broadly defined as multi-layered products of metal, semiconductor, or insulating material on a semiconductor substrate. New technologies in the semiconductor field, such as those in the photolithography field, are covered by this legislation.

STATEMENT

During the 98th Congress, the Committee—acting through the Subcommittee on Courts, Civil Liberties and the Administration of Justice—held two days of hearings on the issue of copyright protection for semiconductor chips (H.R. 1028).[30]

On August 3, 1983, oral testimony was received from the bill's two chief sponsors (Honorable Don Edwards and Honorable Norman Y. Mineta); Jon Baumgarten, Esq. (on behalf of the Association of American Publishers, Inc.); and Thomas Dunlap, Jr., accompanied by Richard Stern, Esq. (on behalf of the Semiconductor Industry Association). A written statement was submitted by the bill's chief sponsor in the Senate (Hon. Charles McC. Mathias).

On December 1, 1983, testimony was received from Professor L. Ray Patterson (School of Law, Emory University); Honorable Gerald J. Mossinghoff (Assistant Secretary of Commerce, Commissioner of Patents and Trademarks, and Chairman of the Working Group on Intellectual Property, Cabinet Council on Commerce and Trade, The White House); and Dorothy Schrader (Copyright Office of the United States).

In addition, the subcommittee solicited and received written statements from a number of qualified individuals and interested organizations, including Professor John Kidwell (School of Law, University of Wisconsin); Professor Alan Latman (School of Law, New York University); Professor Robert C. Denicola (College of Law, University of Nebraska); Michael Lechter, Esq. (Partner, Cushman, Darby & Cushman); the Association of Data Processing Service Organizations (ADAPSO); the American Patent Law Association (APLA); the American Electronics Association (AEA), and the Information Industries Association (IIA).

The subcommittee took note of the fact that during the 98th Congress one day of hearings was held on companion legislation before the Senate Judiciary Subcommittee on Patents, Copyrights and Trademarks.[31]

In addition, during the 96th Congress a further day of hearings was held on the issue of copyright protection for semiconductor chip products by the House Judiciary Subcommittee on Courts, Civil Liberties and the Administration of Justice.[32] The legislative proposal introduced during the 96th Congress[33] was short and simple. Consisting of only fourteen lines, the proposal would have added the following sentence to 17 U.S.C. § 101 (the definitional section for "Pictorial, graphic, and sculptural works"): "Such pictorial, graphic and sculptural works shall also include the photographic masks used to imprint patterns on integrated circuit chips and the imprinted patterns themselves even though they are used in connection with the manufacture of, or incorporated in a useful article."

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[30] See House Hearings (1983), supra note 7.

[31] See Hearings on the Semiconductor Chip Protection Act of 1983 befoe the Senate Judiciary Subcommittee on Patents, Copyrights and Trademarks, 98th Cong., 1st sess. (1983).

[32] See Hearings on Copyright Protection for Imprinted Design Patterns on Semiconductor Chips before the House Judiciary Subcommittee on Courts, Civil Liberties, and the Administration of Justice, 96th Cong., 1st Sess. (1979).

[33] H.R. 1007, 96th Cong., 1st sess. (1979).

Prior to the 1979 hearing, and continuing until today, the Copyright Office has never found mask works to fall within the category of "pictorial, graphic, and sculptural works." The rationale for this practice is found in 17 U.S.C. § 101, which clearly bars registration of the "mechanical and utilitarian aspects" of a pictorial, graphic, or sculptural work. Section 101 further requires that the design of a useful article (as defined in section 101) ". . . shall be considered a pictorial, graphic, and sculptural work *only* if, and *only* to the extent that, such design incorporates pictorial, graphic, or sculptural features that can be identified *separately from*, and are capable of existing *independently of*, the utilitarian aspects of the article." (Emphasis added). No court has ordered otherwise and, therefore, mask works never have received copyright protection under the Copyright Act.[34]

The 1979 legislation was more controversial than expected within the semiconductor industry and among copyright experts. It failed to make legislative progress, and eventually disappeared as a viable proposal.

During the 98th Congress, after the completion of the hearing process, H.R. 1028 went to mark-up. On April 11, 1984, a quorum of subcommittee Members being present, the bill—as amended with a substitute amendment offered by Chairman Kastenmeier[35]—was reported in the form of a clean bill. On April 26, 1984, H.R. 5525 was introduced by Mr. Edwards; the bill was cosponsored by sixty-two Members of the House: Mr. Rodino, Mr. Mineta, Mr. Kastenmeier, Mr. AuCoin, Mr. Badham, Mr. Berman, Mr. Boehlert, Mr. Bosco, Mrs. Boxer, Mr. Brooks, Mr. Brown of California, Mr. Chandler, Mr. Chappie, Mr. Clinger, Mr. Conyers, Mr. DeWine, Mr. Erlenborn, Mr. Fazio, Ms. Fiedler, Mr. Fish, Mr. Frank, Mr. Gekas, Mr. Glickman, Mr. Hawkins, Mr. Hyde, Mr. Jeffords, Mrs. Johnson, Mr. Kindness, Mr. LaFalce, Mr. Lantos, Mr. Lehman of Florida, Mr. Levine of California, Mr. Lowery of California, Mr. Lujan, Mr. McCain, Mr. McCollum, Mr. Martinez, Mr. Mazzoli, Mr. Moorhead, Mr. Morrison of Connecticut, Mr. Mrazek, Mr. Murphy, Mr. Nelson of Florida, Mr. Olin, Mr. Owens, Mr. Panetta, Mr. Pritchard, Mr. Reid, Mr. Richardson, Mr. Ritter, Mr. Rudd, Mr. Sawyer, Mrs. Schneider, Mrs. Schroeder, Mr. Sensenbrenner, Mr. Robert F. Smith, Mr. Stark, Mr. Synar, Mr. Torres, Mr. Waxman, Mr. Wyden, and Mr. Zschau.

Since introduction eleven Members have been added as cosponsors: Mr. Barnard, Mr. Roybal, Mr. Wortley, Ms. Snowe, Mr. Ridge,

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[34] *Esquire, Inc. v. Ringer*, 591 F.2d 796 (D.C. Cir. 1978), cert. denied, 440 U.S.908 (1979); *Norris Industries v. I.T. & T. and Ladd*, 696 F.2d 918 (11th Cir. 1983), cert. denied, U.S. (Oct. 3, 1983).

[35] The differences between H.R. 1028 and H.R. 5525 are explained in this report (see discussion on "sui generis versus copyright approach," supra notes 11-23, and accompanying text, and Appendix A (chart of differences)).

Mr. Kogovsek, Mr. Lagomarsino, Mr. Lungren, Mr. Shaw, Mr. Mica, and Mr. McNulty.

A total of twenty-two Members of the full Committee have cosponsored the bill.

On May 1, 1984, the full Committee considered H.R. 5525, and after general debate, ordered the bill favorably by voice vote without dissent.

SECTION-BY-SECTION ANALYSIS

Section 1

Section 1 of the bill sets forth the bill's short title: "The Semiconductor Chip Protection Act of 1984."

Section 2

Section 2 amends title 17 of the United States Code by adding a new chapter 9 at the end thereof. The new chapter is not a part of the Copyright Act, chapters 1-8 of title 17. Instead, the new chapter creates a sui generis form of intellectual property right, similar in many respects to existing copyright law but differing from copyright law in various ways. Chapter 9 contains sections 901-912, analyzed below.

Section 901—Definitions

Section 901 adds to title 17 a number of new defined terms, which have special application to semiconductor chip products.

Semiconductor chip products.—Section 901(1) defines semiconductor chip product as a multi-layer product of metal, semiconductor, or insulating material on a semiconductor substrate. Semiconductor materials now in use include silicon, germanium, and gallium arsenide. However, the Act is not limited to present technology. Additional semiconductor products will also be covered by section 901(1)'s applicability to semiconductors in general. On the other hand, the Act is limited to what is generally understood as a semiconductor chip and does not extend to other kinds of product, such as magnetic films and printed circuit boards.[38]

Mask work.—Section 901(2) defines a mask work in terms of the two and three dimensional features of the geometry or "topography" of the semiconductor chip to which the work relates. The statutory provisions and case law doctrines of the copyright law excluding functional and utilitarian features of works from copyright protection (see 17 U.S.C. § 101; *Esquire, Inc.* v. *Ringer,* supra) are expressly made inapplicable to mask works by the language following "regardless" in section 901(2).

Fixation in a semiconductor chip product.—Section 901(3) defines initial fixation for a mask work in terms of production of an actual semiconductor chip product, not just a plan or drawing of one. This type of fixation makes a mask work eligible for protection under section 902, infra. However, other kinds of fixation of mask works may be relevant for the purposes of other sections. For example, a mask work can also be fixed in a data base tape (a magnetic tape in which the coordinates of relevant points in a mask or set of masks is encoded in digital form). Fixation in a data base tape is one from which the mask work can be and typically is perceived, reproduced, and otherwise communicated. Thus, copying a tape fixation of this type falls within the reproduction right of section 905(1), infra. However, such fixation is not the kind of initial fixation of a mask work to which section 901(3) refers.

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[38] As originally introduced, H.R. 1028 had a further provision limiting the definition of the semiconductor chip products protected under the Act to those in or affecting commerce. H.R. 5525 is premised on a finding that original mask works are "writings" within the meaning of Article I, section 8, clause 8 of the Constitution. In the unlikely event that a court should find mask works not to be writings, authority for the legislation is found in the commerce clause, to the extent that the chip products and piratical conduct occur in or affect interstate commerce. In virtually all circumstances, this is clearly the case, and consequently a definitional section relating to interstate commerce is unnecessary.

Originality.—Section 901(4) provides that a mask work is "original" if it is the independent creation of an author who did not copy it. This adopts the essence of the customary copyright law concept of originality and applies it to mask works, to the extent it is appropriate and feasible to do so.

Commercial exploitation.—Section 901(5) defines "commercial exploitation" of a mask work. This concept is relevant to determining the duration of mask work protection under section 904, infra, and the time within which a mask work must be registered under section 908, infra, to avoid forfeiture of all rights, and also to other provisions of the Act. Commercial exploitation includes sale of the semiconductor chip product or other distribution (as that concept is used in the Copyright Act) thereof to the public. The word "public" is intended to have a broad meaning, including but not limited to individuals, companies, retailers, commercial end users, non-profit corporations and organizations, and academic institutions. Commercial exploitation also includes offers to sell the semiconductor chip product, once the mask work has already been fixed in a semiconductor chip product. It does not include sales solicitations made before actual production of a commercial semiconductor chip; thus, an invitation to a potential customer to purchase a custom-made chip that is to be developed and produced for the customer's special applications or designed to the customer's specifications would neither start the two-year forfeiture provision running nor the ten-year life of rights under this Act.

Ownership.—Section 901(6) defines "owner" of a mask work to include the author, the legal representatives of a deceased author or one with a legal incapacity, an employer for whom the author created a work made within the scope of an employment relationship, or an assignee. This section's definition of ownership is similar to conventional copyright principles of ownership of a work.

Innocent purchaser.—Innocent purchasers—protected by section 907, infra—are defined in section 901(7) as persons who purchase a semiconductor chip product in good faith and without having notice of protection with respect to that particular chip product.

Notice of protection.—Section 901(8) defines "notice of protection" as having actual knowledge that, or reasonable grounds to believe that, a mask work fixed in a semiconductor chip product is protected under chapter 9 of title 17, United States Code.

Infringing semiconductor chip products.—Section 901(9) sets forth a definition of "infringing semiconductor chip product," which is such a product made, imported, or distributed in violation of the exclusive rights of the owner of a mask work. See sections 903 (ownership and transfer) and 905 (exclusive rights in mask works), infra.

Section 902—Subject matter of protection

Section 902(a) of the Act describes eligibility of authors for enjoyment of copyright in terms of treaty obligations and similar considerations. The provisions under which protection is granted under this Act generally parallels 17 U.S.C. § 104, with several modifications.

Section 902(a) provides that an original mask work fixed in a semiconductor chip product is eligible for protection if certain conditions are met: first, on the date that the mask work is registered or on the date on which the mask work is first commercially exploited, whichever occurs first, the owner of the mask work is a national or domiciliary of the United States, or is a national, domiciliary, or sovereign authority of a foreign country that is a party to a treaty affording protection to mask works to which the United States is also a party, or is a stateless person, wherever that person may be domiciled; second, the mask work is first commercially exploited in the United States; or third, the mask work falls within the scope of a Presidential proclamation issued under paragraph (2). Paragraph (2)(A) authorizes the President to issue proclamations conferring protection under this Act[37] upon a finding that a foreign nation extends protection to mask works of U.S. origin, on substantially the same basis as it protects mask works of its own nationals and domiciliaries and mask works first commercially exploited in that nation.

Subsection (2)(B) provides a further basis for the President to proclaim eligiblity of foreign mask work owners for protection under this chapter; namely, that reciprocal eligibility may be established even where the foreign state accords to its nationals a higher level of protection to mask works, so long as that accorded U.S. owners is "on substantially the same basis as provided in this chapter."

In any event, this becomes a matter for Presidential discretion on a nation-by-nation basis. It is the view of the Committee that this discretion should be carefully exercised.

The Committee is aware that the United States is taking a first step towards elaborating for mask works a system of protection which has international implications. The extent to which other states find our approach sensible, or absorb mask works into their organic copyright laws, must be carefully and sympathetically followed.

Further, the international political complexity of a number of multilateral agreements such as the UCC, Berne Convention, Paris Intellectual Property Convention, as opposed to the relatively simple bilateralism implicit in the Presidential proclamation process, must also be carefully monitored to ensure eventual international comity and harmony in this important area of trade.

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[37] Protection pursuant to Presidential proclamation is limited to: (1) mask work owners who are, on the date on which the mask works are registered under this Act., or the date on which the mask works are first commercially exploited, whichever occurs first, nationals, domiciliaries, or sovereign authorities of that nation; or (2) mask works which are first commercially exploited in that nation.

The Committee urges responsible officials of the legislative and executive branches to consider these legal and policy questions carefully, to inform regularly the Committee of significant developments at the international level, and be in a position to respond to a review of the operations of this law in its international aspects at a future date.

Section 902(b) provides that protection shall not be available for a mask work that is not original or consists of designs that are staple, commonplace, or familiar in the semiconductor industry, or variations of such designs, combined in a way that is not original. It is the view of the Committee that it is appropriate to require some minimum of creativity to qualify a mask work for protection under the Act. At the same time, the Committee desired to prevent public domain material from being usurped and turned into proprietary rights. There is a fundamental congressional policy against "recapturing" works in the public domain; this legislation pays careful heed to that policy. Accordingly, section 902(b)(2) prevents mere staple and commonplace designs from being taken out of the public domain. On the other hand, the Committee recognizes that all chip designs consist of arcs, lines, rectangles, and like staple designs; in a new chip these staple designs are arranged in an original particular way. The key to section 902(b)(2)'s protection of the public against usurpation of the public domain is the final phrase, "combined in a way that is not original." To be eligible for protection, the combination of arcs, lines and rectangles in a mask work must be original (and, of course, the combination must owe its origin to the alleged author). If staple, familiar, or commonplace elements are combined in a way that is not original, the resulting mask work is not protectable under this Act. The subject matter of the mask work must be original, when considered as a whole, even though, if the individual elements of the mask work were dissected away from the whole they might appear familiar or commonplace. A patentable combination, by contrast, must also be inventive, i.e., not obvious. For example, the new combination may be required to produce novel, startling and unexpected results. This Act does not so require for chips.[28]

Section 902(c) distinguishes the subject matter of the Semiconductor Chip Protection Act from the subject matter of the patent laws. In this regard, section 902(c) parallels section 102(b) of the Copyright Act.

Section 903—Ownership and transfer

Section 903 concerns ownership and transfer of proprietary rights in mask works. Subsection (a) vests in the owner of a mask work the exclusive rights described in section 905. Subsection (b) permits transfer of all or part of the rights under this Act in a mask work and gives ownership rights in a mask work the same attributes as other forms of personal property. This subsection is generally similar to 17 U.S.C. § 201 and 35 U.S.C. § 261 and, like those sections, merely permits rights to be transferred without affecting the applicability of other relevant laws to the transfer (e.g., state contract law, the antitrust laws). Subsection (c) is generally similar to 17 U.S.C. § 105, and excludes from protection any mask works created by government employees as part of their official duties.

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[28] This provision does not mandate an examination system for chips like that provided for patent applications. See discussion of § 908(e), infra. In the event of mask work infringement litigation, failure to satisfy the requirements of § 902(b) would be a defense.

Section 904—Duration

Section 904(a) begins protection under the Act on the date of registration of the mask work or the date of first commercial exploitation, whichever occurs earlier. Section 904(b) continues the term of such protection for ten years after the date on which protection begins.

Section 905—Exclusive Rights

Section 905 describes the exclusive rights enjoyed by the owner of a mask work.

Reproduction.—First, section 905(1) creates a reproduction right, generally similar to that of 17 U.S.C. § 106(1). The owner of a mask work under this Act has the exclusive right to reproduce the work in any way, including any manufacturing method. Complete reproduction of a mask work is not required in order to constitute an infringement of the owner's exclusive right of reproduction. Unless a valid defense is presented, a judge or jury could find an infringement if the mask work embodied in the "copied" semiconductor chip is substantially similar to the registered mask work. If this was otherwise, an infringer could immunize himself by adding a mistake to a mask work copied in its entirety. Difficult fact finding responsibilities are commonly assigned to Federal judges and juries in our justice system, and the Committee is confident that these individuals will successfully implement the judicial components of this Act.[39] Optical means, such as conventional mask lithograpy, are the most common means for reproducing a mask work in a semiconductor chip product; optical means are also most typically the means for reproducing the work in the form of the masks used in mask lithography to manufacture semiconductor chip products. However, electronic means of reproduction are also in use at this time. For example, a mask work can be stored in a data base tape, so that the coordinates of various points in the semiconductor chip product are recorded. The mask work can then be reproduced in a semiconductor chip, in a mask, or in another tape by means of the data base tape. The tape can be utilized, also, in conjunction with a computer and computer program, to drive an electron gun that directly etches patterns in the semiconductor chip product, or to drive a light beam that polymerizes "resist" on the surface of the chip during the manufacturing process so that a pattern can then be etched onto the surface. The language of paragraph (1) is intended to include all of these and any other means of reproducing mask works.

Importation and distribution.—Paragraph (2) creates an exclusive importation and distribution right; this paragraph is similar to 17 U.S.C. §§ 106(3) and 602(a).

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[39] For further analysis of "substantial similarity," see discussion of section 910, infra.

Contributory infringement.—Paragraph (3) makes contributory infringement of the reproduction, distribution, and importation rights an act of infringement. Such a provision has no statutory analogue in the Copyright Act. Paragraph (3) does follow, however, a contributory infringement standard described generally in *Sony Corp.* v. *Universal City Studios*, 104 S. Ct. 774 (1984), and *Aro Mfg. Co.* v. *Convertible Top Replacement Co.*, 377 U.S. 476 (1964).[40]

Section 906—Reverse engineering, first sale

Reverse engineering.—Section 906(a) immunizes from liability under this Act reproduction of the mask work for the purpose of teaching, analyzing, or evaluating the concepts or techniques embodied in the mask work or the circuitry or organization of components used in the mask work.

This section thus codifies the established industry practice of "reverse engineering." It is therefore permissible for a competitor to reproduce a mask work by photographing the semiconductor chip product and studying and analyzing the photograph, in order to create another semiconductor chip product that competes with the first one.[41] A number of witnesses testified as to the practice in the semiconductor industry of reverse engineering a chip, and how to distinguish between chip piracy and legitimate reverse engineering. They emphasized the evidentiary importance of the "paper trail" of legitimate reverse engineering that helps to distinguish it from mere piracy.[42] The Committee intends that the courts, in interpreting section 906(a), should place great weight on objective documentary evidence of this type.

During both the 1979 and 1983 hearings, the concept of "reverse engineering" was the subject of considerable attention.[43] Witnesses generally agreed that two polar situations are encountered: Photographic reproduction of the layout of the original chip and direct incorporation thereof into a second chip; and making improvements on, or at least alternatives to, an existing chip and incorporating substantial but not identical parts of its design into the second chip.

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[40] H.R. 1028, as introduced, had a more elaborate catalogue of exclusive rights enjoyed by the owner of the mask work. The subcommittee believed that one of these rights—the "use" right—was unnecessary and several of the others duplicative of what remains. The "use" right would have given the owners of mask works the power to sue and recover from persons who used a pirated chip, such as using it in a factory as part of a computerized machine, even though the user had not itself copied, manufactured, or sold the pirated chip. While such a "use" right exists under the patent laws (35 U.S.C. § 271(a)), and may well be appropriate as part of some newly created intellectual property rights, the use right does not exist under the copyright laws, and a number of witnesses questioned the inclusion of such a right in a law protecting mask works. Accordingly, the subcommittee decided to omit such a right as part of this new form of intellectual property, unless and until a showing of real need for such protection is made.

Other exclusive rights provided in the original version of H.R. 1028 have been consolidated now into the reproduction right of section 905(1). This provision is based on the reproduction right provision of original H.R. 1028, but the limitation to reproduction on semiconductor material in the course of manufacture of a semiconductor chip has been eliminated, thereby broadening the reproduction provision to pick up substantially the same rights that section 4 of original H.R. 1028 provided piecemeal. Thus, embodying the mask work in a mask, using a mask embodying a mask work to manufacture a semiconductor chip product, and reproducing images of a mask work on material (clauses (6)(A), (C), and (D), respectively, of section 4 of original H.R. 1028) all are comprehended within the reproduction right of section 905(1).

[41] See National Geographic, supra note 4, at 448–49 for an illustration of this process.

[42] See House Hearings (1983), supra note 7 (Statement of F. Thomas Dunlap, Jr.: "When there is a legitimate job of reverse engineering, there is a very big paper trail, there's computer simulations, there's all kind of time records, people who have spent an enormous time understanding and figuring out how to make that design") (See also statement of Dorothy Schrader).

[43] See House Hearings (1979), supra note 32, at 21, 57, 69, 70–71, 72–73; House Hearings (1983), supra note 7 (statements of Dorothy Schrader, Jon A. Baumgarten, and F. Thomas Dunlap); Senate Hearings (1983), supra note 31, at 14–15, 65–66, 75, 83–86, 103–106. See also S. Rept. No. 96–425 at 21–22 and statements of Rep. Edwards in Cong. Rec. E5586, 95th Cong., 2d sess. (Daily ed. Oct. 14, 1978); Cong. Rec. H645, 98th Cong., 1st sess. (Daily ed. Feb. 24, 1983); and statement of Senator Mathias, Cong. Rec. S5992, 98th Cong., 1st sess. (Daily ed. May 4, 1983).

In providing in section 906(a) of the Act for a reverse engineering limitation on the exclusive rights granted in mask works, it is the intent of the Committee to permit and encourage the second type of conduct, but reproduction of the layout of one chip "solely for the purpose of teaching, analyzing, or evaluating the concepts or techniques embodied in the mask work or the circuitry or organization of components used in the mask work" is permitted, even when this is a preliminary step toward the second type of conduct.

Thus, the Committee believes that the reproduction of portions or all of a mask work in a nonprofit classroom or similar place devoted to instruction, for the purpose of studying the principles of computer chip design, does not interfere with the market for or value of the mask work, provides a benefit to the public in advancing scientific knowledge, and should not form the basis for any liability under the Act.

Based on testimony of industry representatives that it is an established industry practice to similarly make photo-reproductions of the mask work in order to analyze the existing chip so as to design a second chip with the same electrical and physical performance characteristics as the existing chip (so-called "form, fit and function" compatibility), and that this practice fosters fair competition and provides a frequently needed "second source" for chip products, it is the intent of the Committee to permit such reproduction by competitors where such reproduction is "solely for the purpose of teaching, analyzing, or evaluating" the concepts, techniques, etc. embodied in the work, rather than mere wholesale appropriation of the work and investment in the creation of the first chip.

It is the intent of the Committee to permit, under the reverse engineering limitation, the "unauthorized" creation of a second mask work whose layout, in substantial part, is similar to the layout of the protected mask work—if the second mask work was the product of substantial study and analysis, and not the mere result of plagiarism accomplished without such study or analysis.

The Committee believes that this approach strikes the appropriate balance between the rights of the creator and the needs of the public. Designers of future mask works are left free to copy any "idea, procedure, process, system, method or operation, concept, principle, or discovery" (section 902(c)), which includes "concepts or techniques embodied in the mask work or the circuitry [44] or organization of components used in the mask work" revealed as a result of the reverse engineering permitted in section 906(a).

In examining whether a given reproduction qualifies for the reverse engineering privilege of section 906(a) it is the intent of the Committee that the doctrine be developed and adapted on a case by case basis, like the copyright doctrine of fair use.[45] As with the fair use doctrine, reverse engineering is an affirmative defense.

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[44] Provided, of course, that the circuitry is not the subject of patent protection.

First sale.—Section 906(b) carries over to mask works the "exhaustion of monopoly rights" and "first sale" doctrine of 17 U.S.C. § 109(a) and many years of case law. As in the case of copyrighted products, the owner of a mask work has no right to try to exercise "remote control" over the pricing or other business conduct of its semiconductor chip customers, once the semiconductor chips have passed into their hands. Except where the Congress expressly orders otherwise, the exhaustion of any rights by the first authorized sale is a basic tenet of our intellectual property law. See *Bobs-Merrill Co.* v. *Straus*, 210 U.S. 339 (1908); *Adams* v. *Burke*, 84 U.S. (17 Wall.) 453 (1873); *Independent News Co.* v. *Williams*, 293 F.2d 510 (3d Cir. 1961); *C. M. Paula Co.* v. *Logan*, 355 F. Supp. 189 (N.D. Tex. 1973). Accordingly, the Act specifies that purchasers of semiconductor chips have the right to use and resell them freely (whether as chips or incorporated into other products which contain chips).

Section 907—Innocent infringement

Section 907 provides a further limitation on the exclusive rights of mask work owners. Innocent infringers are given exemptions from and limitations on liability. First, section 907(a)(1) exempts from any liability at all the sale of infringing units of protected semiconductor chip products where the purchaser of infringing chips resells them before ever having notice that the chips are protected by this Act. Second, section 907(a)(2) provides that when a person purchases infringing chips innocently, but is given notice of infringement before reselling the chips (e.g., as part of a machine that the purchaser manufactures and sells), the innocent purchaser may resell those chips subject to payment of a reasonable royalty to the mask work owner. The reasonable royalty is to be determined by voluntary negotiation between the parties, mediation, or binding arbitration as determined contractually by the parties, or else, if the parties do not resolve the issue, by a court in an infringement action that the owner of the rights in the mask work brings against the purchaser. It is the view of the Committee that alternatives to litigation will work well here, ultimately achieving equitable results, and reducing litigation costs; consequently, this section will not have a significant impact on the Federal courts. However, this provision is not intended to inject an exhaustion requirement into the Act.[46]

Subsection (b) provides that the same immunity or limitation of liability, as the case may be, extends to customers of the innocent purchaser. Subsection (c) emphasizes that the immunity and limitation of liability apply only as to those specific chips that were innocently purchased. There is no "grandfathering" for later purchases of the same type of chip, made by the same person after notice of infringement has occurred and that person's "innocence" is dispelled as to the rights of the mask work registrant.

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[45] 17 U.S.C § 107 (1978). The provisions of Section 107 do not apply to this Chapter, see Section 912(b), and thus there is no right of fair use under the Act.

[46] For further information about alternatives to litigation, see Public Law 96-190, 94 Stat. 17 (1980) (the "Dispute Resolution Act"). See also Hearing on the Dispute Resolution Act Before the House Judiciary Subcommittee on Courts, Civil Liberties and the Administration of Justice, 95th Cong., 2d Sess. (1978); Hearing on Resolution of Minor Disputes Before the Hosue Judiciary Subcommittee on Courts, Civil Liberties and the Administration of Justice and the House Commerce Subcommittee on Consumer Protection and Finance, 96th Cong. 1st Sess. (1979).

Whether innocent or not, the mere purchase of an infringing produce does not give rise to liability. The owner of a mask work has the exclusive right under section 905(2) to distribute (including to sell) the chip, but the owner has no exclusive purchasing right. For further information about this concept in copyright law, see *Foreign & Domestic Music Corp.* v. *Licht*, 196 F.2d 627 (2d Cir. 1952) (L. Hand, J.) (purchase not copyright infringement).

Section 908—Registration

Unlike the Copyright Act, which makes copyright registration voluntary, this Act requires registration within a reasonable time upon pain of forfeiture of rights under the Act. Mask work owners have two years within which to register; after that, the mask work falls into the public domain if it has not been registered. The Committee believes that this requirement is necessary and desirable to create greater certainty of rights, both for the public and the owners of the mask works.

Forfeiture of rights.—Section 908(a) of the Act provides that protection in a mask work terminates if an application for registration is not filed within two years after the date of first commercial exploitation. As previously discussed, commercial exploitation includes sale of the semiconductor chip product or other distribution thereof to the public, and also offers to sell the semiconductor chip product, once the mask work has already been fixed in a semiconductor chip product (but does not include sales solicitations made before actual production of a commercial semiconductor chip).

Administration.—Section 908(b) confers administrative responsibility for registration of mask works on the Copyright Office. The Register of Copyrights is made responsible for all administrative functions and duties for this chapter. By specific cross reference to chapter 7,[47] the provisions relating to general responsibilities, organizations, regulatory authority, actions, records, and publications of the Copyright Office shall apply. The Register is authorized, however, to make such modifications to those sections as are necessary to satisfy the requirements of this Act. Section 908(c) authorizes and directs the Copyright Office to establish registration procedures. Section 908(d) directs the Copyright Office to establish fees for registration and related services. The level of such fees is to be set by the Copyright Office, taking into consideration the reasonable costs associated with providing the services. The Register must also consider the statutory fee schedules under the Copyright Act, and also, as a countervailing factor, the benefit to the public of having a public record as to mask works. By requiring consideration of cost and the public interest, the Register will have to balance competing demands. It is the view of the Committee that such balancing will result in fee levels being set at lower than a user fee level.

Examination.—Section 908(e) establishes an examination procedure for chips essentially the same as that under the Copyright

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[47] This specific cross reference is the only such reference found in the bill to a provision in the Copyright Act. Section 908(c), infra, contains a general cross reference.

Act. That is, applications are examined only on the basis of the facts set forth in the application, the deposit copy and other identifying material, and the applicable statute, case law and regulations. If the application, identifying materials, and any other information supplied by the applicant or otherwise known to the examiner support the conclusion that the claim is facially in compliance with the statute and regulations, a certificate of registration issues. Thus, there is no examination of the prior art like that under the patent laws.

Certificate of registration.—Section 908(f) provides that a certificate of registration is prima facie evidence of the facts stated in the certificate (such as, presumably, the name of the owner, the fact of ownership, the date of first commercial exploitation, whether the work was for hire, and other information similar to that typically required in a copyright application under 17 U.S.C. § 409). The certificate is also prima facie evidence that the applicant satisfied the requirements of this Act and the Copyright Office's regulations thereunder.

Refusal and failure to register.—Section 908(g) permits an applicant to sue the Register of Copyrights if he or she refuses to issue a certificate of registration of rights under this Act. The suit would be in a Federal district court, and in accordance with the Administrative Procedures Act, 5 U.S.C., chapter 7. Venue of such actions is to be governed by the usual provisions, 28 U.S.C. § 1391(e) (the district of the plaintiff's residence or the District of Columbia). If the Register fails to act on an application within three months after it has been received in the Copyright Office, the applicant may treat the failure as a refusal to register and sue to compel registration. A reasonable request by the Register for further information or identifying materials shall not be considered as a failure to act.

Section 909—Notice

Section 909(a) makes notice of mask work protection optional. However, use of notice constitutes prima facie evidence of notice to others that the mask work is protected. Section 909(b) provides an optional form of notice for mask works analogous to that which exists for copyrights and trademarks. The letter M in a circle is used for mask works, as C in a circle, P in a circle, and R in a circle are respectively used for copyrights, sound recordings, and registered trademarks.

Section 910—Enforcement of exclusive rights

Sections 910-911 provide enforcement procedures and remedies for mask works. These sections are generally similar to those which 17 U.S.C. §§ 501-503 and 507(b) provide for copyrighted works. Criminal penalties were not deemed appropriate or necessary, but the maximum level of statutory damages was raised to $250,000, as compared to $10,000 generally and $50,000 maximum for willful conduct (see 17 U.S.C. §§ 504, 506). Also, the prejudgment relief provisions of 17 U.S.C. § 503 are not carried forward.

Section 910(a) defines infringement of a registrant's rights in a mask work in essentially the same terms as 17 U.S.C. § 501(a) defines copyright infringement. It is intended that the concept of infringement of rights in a mask work be essentially the same as that of infringement of a copyrighted work. Legal concepts used to establish infringement in copyright law—substantial similarity, idea versus expression,[48] and merger of idea and expression when function dictates form [49]—are all carried forward, insofar as applicable, to the new law for mask works protected under this Act.

It is the view of the Committee that existing copyright law can be relied upon to yield a number of principles helpful in interpreting the protection created by this Act. An underlying principle of new chapter 9 is that the reproduction right of § 905(1) is infringed under § 910(a) only when the work alleged to be infringing reproduction rights is "substantially similar" to the protected, registered work. If the mask work embodied in an alleged infringing chip is substantially similar to a registered mask work, then there can be a judicial finding of infringement of the rights conferred by this Act (unless of course an applicable defense of reverse engineering or innocent infringement or others is proved). If the mask work embodied in the alleged infringing chip is not substantially similar to the registered work, there could be no infringement. The second manufacturer is simply engaged in privileged, and socially valuable, free competition from which the public benefits.

While the Committee believes that the courts may usefully consider the copyright law precedents concerning substantial similarity, the Committee also intends that the courts should have sufficient flexibility to develop a new body of law specifically applicable to semiconductor chip infringement. Moreover, the concept of "substantial similarity" varies depending upon the nature of the work.[50] Cases concerning fictional or imaginative works are not necessarily relevant to semiconductor chip infringement; chips are not the same as books, especially fictional literary works. The Committee believes that the line of cases regarding infringement of fact-based works, compilations, and directories provides precedents more applicable to semiconductor chips. See e.g., *Triangle Publications, Inc.* v. *New England Newspaper Pub. Co.*, 46 F. Supp. 198 (D. Mass. 1942); *Triangle Publications, Inc.*, v. *Sports Eye, Inc.*, 415 F. Supp. 682 (E.D. Pa. 1976); *New York Times Co.* v. *Roxbury Data Interface, Inc.*, 434 F. Supp. 217 (D. N.J. 1977); and *Miller* v. *Universal City Studios, Inc.*, 650 F.2d 1365 (5th Cir. 1981).

Mask works sometimes contain substantial areas of (so-called "cells") whose layouts involve creativity and are commercially valuable.[51] In appropriate fact settings, the misappropriation of such a cell—assuming it meets the originality standards of this chapter—could be the basis for an infringement action under this chapter. No black letter rule of law can be formulated to draw a precise boundary between substantial similarity and insubstantial similarity under this chapter. This is a classic type of legal question to be put to the judge or jury.

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[48] See *Baker* v. *Selden*, 101 U.S. 99 (1879). Section 102(b) of the Copyright Act clearly provides that, "In no case does copyright protection for an original work of authorship extend to any idea, procedure, process, system, method of operation, concept, principle or discovery, regardless of the form in which it is described, explained, or embodied in such work."

[49] See *Morrissey* v. *Procter & Gamble Co.*, 379 F.2d 675, 678 (1st Cir. 1967): "Moreover, where there are only a limited number of ways to express an idea, there may be no protection for the particular expression.

[50] Compare *Sheldon* v. *Metro-Goldwyn Pictures Corp.*, 81 F.2d 54 (2d Cir. 1936), cert. denied, 298 U.S. 669 (1936) (state play infringed by motion picture, both loosely based on historical murder) with *Hoehling* v. *Universal City Studios, Inc.*, 618 F.2d 972 (2d Cir. 1980) (factual book not infringed by motion picture, even though precise events and theories not available elsewhere were copied).

[51] For example, the layout for a counter or an oscillator may be contained in a mask work along with many other "cells" or other parts that together comprise the entire semiconductor chip product. Such a cell may be usable in other chips, and may be the subject of a "cell library license."

Section 910(b) permits the owner of the rights in a registered mask work to institute a civil action for infringement, similar to a copyright infringement action. The jurisdictional and other provisions of the Judicial Code (e.g., 28 U.S.C. § 1338) that apply to copyrights are intended to apply also to mask work rights.[53]

Section 910(c) permits the applicant for registration of a mask work to sue for infringement even if the Copyright Office refuses registration. This provision is similar to 17 U.S.C. § 411(a). If the Copyright Office does not refuse to issue a certificate of registration, and simply fails to act, the applicant may treat the failure to register as a refusal, pursuant to section 908(g) of this Act, and then can sue anyway. The Copyright Office may then intervene in the action.

Section 910(d) directs the Treasury and Postal Service to issue regulations to exclude infringing products from entry into the United States. These provisions are generally similar to those of 17 U.S.C. § 603. Accordingly, the owner of rights in a mask work will be able to obtain the assistance of the Customs Service in preventing pirated chips from being imported into the United States. This remedy is in addition to, not in lieu of, the owner's other rights and remedies, such as the right to attempt to secure an injunction against importation from a district court or an exclusion order from the International Trade Commission under 19 U.S.C. § 1337. However, the Customs Service may insist upon such an order as a condition precedent to Customs' action, when the nature of the case so requires to prevent error or injustice.

Section 911—Remedies for infringement

Section 911(a) provides for temporary restraining orders and preliminary injunctions, similar to 17 U.S.C. § 502(a).

Section 911(b) provides for damages and profits, in similar language to that of 17 U.S.C. § 504(b).

Section 911(c) provides statutory damages, in terms generally analogous to 17 U.S.C. § 504(c), but the discretionary amount that can be awarded to the plaintiff is raised to $250,000. This higher limit to what the fact finder (judge or jury as the case may be) may award is based on the very substantial front-end costs of chip creation and the severe adverse economic impacts of misappropriation or incentives to creation of new technology. If also counter-balances the absence of criminal sanctions. Unlawful chip copying, an activity designed primarily for commercial gain, is best controlled through substantially economic sanctions. In using the term "court" in Sections 911 (b) and (c) it is the intent of the Committee, as under 17 U.S.C. § 504(c), that there be a right to a jury where requested.

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[53] See section 912(d), infra.

Section 911(d) provides for counsel fees, similar to 17 U.S.C. § 505.

Section 911(e) creates a three-year statute of limitations and is parallel to present 17 U.S.C. § 507(b).

Section 911(f) provides for seizure and impoundment of infringing chips, masks data base tapes, and other products used to make infringing products; the section is parallel to present 17 U.S.C. § 509.

Section 912—Relation to other laws

Section 912 relates the provisions of this Act to the existing copyright and patent laws.

Section 912(a) provides that nothing in this Act concerning mask works shall add to or detract from existing rights as to copyrighted or patented works. Specifically, it is not intended that Chapter 9 limit, enlarge or otherwise affect the scope, duration, ownership or subsistence of copyright protection under Chapters 1 through 8 in computer programs, data bases, or any other copyrightable works embodied in semiconductor chip products. For example, if a semiconductor chip product contains patented circuitry, the patent is not affected by this Act's mask work protection of the chip layout. The patent rights commence when the patent issues and end 17 years later. The mask work rights begin and end as this Act provides. The two are wholly independent. Similarly, if there is a valid copyright in any computer program or "book on a chip" stored in a semiconductor chip product (e.g., in the microcode of the ROM of a microprocessor), that copyright exists independently of the mask work protection under this Act for the layout of the microprocessor chip. Whatever protection the copyright and patent laws afford continues, completely unaffected by this Act or registration of works under it. Thus, the limitations on protection for mask works such as the section on innocent infringement and the ten-year period of protection have no application whatsoever to copyright or patented works embodied in mask works or in a semiconductor chip product. It should be equally clear, however, that an owner of a semiconductor chip product cannot get 10 years protection under this Act and longer protection under the Copyright Act—either life plus 50 years, 75 years, or 100 years (works made for hire)—for the same mask work. Mask works are presently unprotected under the Copyright Act, and the Committee intends no change in their unprotected status under copyright.

Section 912(b) is a technical provision, preventing references within the codified Copyright Act (17 U.S.C., chapters 1-8) to itself from being interpreted as referring to this Act (which will become 17 U.S.C., chapter 9).

Section 912(c) is derived from 17 U.S.C. § 301(a), and preempts state laws that would provide protection equivalent to this Act. For example, a state may not grant its own form of protection to mask works, so that chips in the public domain under this Act become protected under the state law, or so that chips protected under this law were subjected to free use under state law. See generally, *Sears, Roebuck, & Co.* v. *Stiffel Co.*, 376 U.S. 225 (1964); *Compco Corp.* v. *Day-Brite Lighting, Inc.*, 376 U.S. 234 (1964).

The Committee intends, however, that state laws protecting trade secrets shall not be preempted. Trade secret laws provide a different form of protection than that found in Chapter 9.

As under section 301 of the Copyright Act, state trade secret law provides "non-equivalent" rights and remedies and thus constitutes a notable example of an exception to federal preemption.[53] The availability of trade secret protection, subject to the traditional criteria for trade secrets, is important for mask works; but such availability is doubly important prior to regisration or commercial exploitation of the mask work, because under section 904(a) a mask work has no protection under chapter 9 until it has been registered or commercially exploited. As a consequence, state trade secret law is a necessary adjunct to this Act, and provides needed protection during a time period when this law provides none.[54]

Of course, a state could not, in the name of state trade secret law, provide protection for non-secrets. As the Supreme Court stated in *Kewanee Oil Co.* v. *Bicron Corp.*, 417 U.S. 470, 475 (1974), "the subject of a trade secret must be secret, and must not be of public knowledge or of a general knowledge in the trade or business." Also, a state could not protect against competition the "secrecy" of a mask work that is concealed only by being placed inside the plastic or ceramic package of a publicly marketed semiconductor chip—whether or not the creativity of the chip's layout satisfied § 902(b)(2). If state law did so, it would "give protection of a kind that clashes with the objectives of the federal [mask work] laws." *Sears, Roebuck & Co.* v. *Stiffel Co.*, 376 U.S. 225, 231 (1964). "To forbid [such] copying would interfere with the federal policy, found in [this Act], of allowing fee access to copy whatever the federal [mask work] laws leave in the public domain." *Compco Corp.* v. *Day-Brite Lighting, Inc.*, 376 U.S. 234, 237 (1964).

Section 912(d) is a technical amendment, making certain provisions of the Judicial Code that apply to copyrights also apply to mask works protected by this Act.

Section 3—Table of Chapters

Section 3 of this Act provides a necessary conforming change, amending the table of chapters in title 17 to include chapter 9.

Section 4—Effective Date

Section 4 concerns the effective date of the Act. Generally, the Act takes effect on January 1, 1985. However, a phase-in period is provided. Section 4(b)(1) gives limited protection to mask works put onto the market on or after January 1, 1984. However, mask works must be registered promptly to qualify for such limited protection; the application must be filed during 1985 or the right to come within this section is forfeited.

Section 4(b)(2) describes the limited protection for chips introduced in 1984. If a domestic or foreign manufacturer manufactures semiconductor chips before January 1, 1985 (i.e., during 1984), even though that manufacturer copied the products in 1984 from the owner of the mask work, the copying manufacturer (and its distributors) can sell in the United States (and can import into the United States) all of the units that the manufacturer manufactured in 1984, subject only to the payment to the mask work owner of the reasonable royalty specified in section 907(a)(2), supra.[55]

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[53] Other examples of "non-equivalent," and hence non-preempted, State rights would include breaches of contract, breaches of trust, trespass, conversion and deceptive trade practices such as passing off and false representation.

[54] In contrast, H.R. 1028 as introduced and the copryright laws would commence protection of a work upon its initial fixation. See 17 U.S.C. §§ 102(a), 302(a); See also 17 U.S.C. § 101 (definition of "created").

The Committee was well aware of the dangers—constitutional and otherwise—lurking in retroactive legislation. See 1 *Nimmer on Copyright*, § 1.11 (1982). Indisputably, an interest in a copyright is a property right protected by the due process and just compensation clauses of the Constitution. See *Roth* v. *Pritikin*, 710 F.2d 934, 939 (2d Cir. 1983); *Lorett* v. *Teleprompter Manhattan CATV Corp.*, 458 U.S. 419 (1982). The Committee presumes that retroactive mask work protection would be subjected to the same constitutional analysis as retroactive copyright legislation. As a consequence, the Committee prefers not to confront the spectre of a constitutional issue concerning the proper application of the takings and due process clauses. Section 4(b)(2) therefore contains a very short retroactive time period coupled with a compulsory license (see section 907, infra).[56] A short retroactive time-period—back to January 1, 1984—can be justified due to the fact that copyists had been on notice since that time that legislation was likely to pass before the end of the 98th Congress.[57] A similar "notice" argument cannot be made for past Congresses, because each new Congress starts afresh. Thus, legislation introduced during the 96th Congress—which did not even make it to subcommittee mark-up and was substantially different from any bill pending in the 98th Congress—cannot be considered as due notice that favorable action would occur during the 98th Congress. The limits of the Constitution, absent a showing of overriding national need and significant public purpose which has not been made to this Committee, cannot be so stretched without risking a judicial finding of unconstitutional infirmity.

In comparison, a reasonable argument can be made for a short retroactive time-period coupled with an innocent infringement section (e.g., compulsory licensing). Due notice has occurred and the "taking" amounts only to payment of a reasonable sum of money for using a "copied" chip product in the future.

Moreover, making the Act effective on the date of enactment would have encouraged creators to keep "state of the art" chips off the market in anticipation of prospective protection, thereby dramatically reducing the creativity that is one of the principal goals of this legislation. The Committee therefore opted for a relatively short phase-in period. The net-result will benefit the public.

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[55] For example: United States company A puts a new chip onto the market on March 1, 1984; foreign company B copies the mask work embodied in the chip and manufactures 100,000 such chips during 1984; B manufactures another 250,000 such chips in 1985. Subject only to payment of a reasonable royalty to A, B can export all of the first 100,000 chips to the United States, and B or its distributors can sell those chips in the United States, in 1985, 1986, or any subsequent year, without further liability to A under this Act. However, none of the second 250,000 chips may be imported into the United States or be distributed in the United States during the ten-year life of A's rights under this Act. The same principles would apply to company C, a United States copyist. Thus, this section affords the same rights and liabilities to domestic and foreign manufacturers.

[56] In contrast, H.R. 1028 as introduced was fairly clearly retroactive in application. Similarly, S. 1201 (as reported by the Senate Judiciary Committee) is retroactive to 1980.

[57] On Jan. 1, 1984, hearings had been terminated in both the House and Senate. Prior to that date (on Nov. 17, 1983), the Senate Subcommittee on Patents, Copyrights and Trademarks approved a substitute amendment to S. 1201. In the House, an announcement had been made that a subcommittee mark-up was imminent.

OVERSIGHT FINDINGS

Oversight of this Nation's intellectual property laws—patents, trademarks and copyright—is the responsibility of the Committee on the Judiciary. During the 96th and 98th Congresses, the committee, acting through the Subcommittee on Courts, Civil Liberties, and the Administration of Justice, held numerous days of hearings on the specific issue of copyright protection for semiconductor chip products and the general subject of copyright and technological change.

Pursuant to clause 2(a)(3)(A) of rule XI of the Rules of the House of Representatives, the committee issues the following findings:

> to promote the progress of science and useful arts, the Constitution of the United States, in Article I, Section 8, Clause 8, authorizes the Congress to grant authors for a limited time "the exclusive right to their . . . writings";
>
> the intellectual property system of the United States must meet the constitutional mandate by providing an economic incentive to authors of new categories of creative works, while encouraging the public availability of such works;
>
> there is a demonstrated need to protect original mask works fixed in semiconductor chip products;
>
> the existing provisions of title 17, United States Code, do not protect mask works fixed in semiconductor chip products, in and of themselves; and
>
> it is preferable to protect original mask works fixed in semiconductor chip products outside the scope of traditional copyright by adding a new chapter to title 17 of the United States Code, separate from an independent of Chapters 1 through 8, in order to afford protection for original mask works as a "writing" under the Constitution or under the authority of the Commerce Power of the Constitution.

NEW BUDGET AUTHORITY

In regard to clause 2(l)(3)(B) of rule XI of the Rules of the House of Representatives, the bill creates no new budget authority on increased tax expenditures for the Federal government.

INFLATIONARY IMPACT STATEMENT

Pursuant to clause 2(l)(4) of rule XI of the Rules of the House of Representatives, the committee feels that the bill will have no foreseeable inflationary impact on prices or costs in the operation of the national economy.

FEDERAL ADVISORY COMMITTEE ACT OF 1972

The Committee finds that this legislation does not create any new advisory committees within the meaning of the Federal Advisory Committee Act of 1972.

COST ESTIMATE

In regard to clause 7 of rule XIII of the Rules of the House of Representatives, the Committee agrees with the cost estimate of the Congressional Budget Office.

STATEMENT OF THE CONGRESSIONAL BUDGET OFFICE

Pursuant to clause 2(l)(3) of rule XI of the Rules of the House of Representatives, and section 403 of the Congressional Budget Act of 1974, the following is the cost estimate on H.R. 5525 prepared by the Congressional Budget Office.

U.S. CONGRESS,
CONGRESSIONAL BUDGET OFFICE,
Washington, D.C., May 14, 1984.

Hon. PETER W. RODINO, Jr.,
Chairman, Committee on the Judiciary, U.S. House of Representatives, Rayburn House Office Building, Washington, D.C.

DEAR MR. CHAIRMAN: The Congressional Budget Office has reviewed H.R. 5525, the Semiconductor Chip Protection Act of 1984, as ordered reported by the House Committee on the Judiciary, May 1, 1984. We estimate that enactment of this bill would cost the federal government about $200,000 per year for the next three years, and less thereafter.

H.R. 5525, which would become effective January 1, 1985, would grant ten-year proprietary protection to mask works for semiconductor chip products. It would establish a registration process administered by the Copyright Office and would take a number of other steps for the protection of mask works.

Based on information provided by the Copyright Office, we expect some costs to be incurred for conversion of existing computer software and for processing of copyright applications, offset partially by registration fees. The net costs are expected to be about $200,000 per year in fiscal years 1985 through 1987, and less than $100,000 annually thereafter.

No costs will be incurred by state or local governments as a result of the enactment of this bill.

This letter supersedes a previous estimate dated May 9, 1984, and clarifies the description of the bill's purpose. The estimated cost of the bill remains the same.

If you wish further details on this estimate, we will be pleased to provide them.

Sincerely,

ERIC HANUSHEK
(For Rudolph G. Penner, Director).

COMMITTEE VOTE

H.R. 5525 was reported favorable by voice vote, no objection being heard, and a quorum of Members being present.

CHANGES IN EXISTING LAW MADE BY THE BILL, AS REPORTED

In compliance with clause 3 of rule XIII of the Rules of the House of Representatives, changes in existing law made by the bill, as reported, are shown as follows (existing law proposed to be omitted is enclosed in black brackets, new matter is printed in italic, existing law in which no change is proposed is shown in roman):

TITLE 17, UNITED STATES CODE

TITLE 17—COPYRIGHTS

Chap.		Sec.
1.	Subject Matter and Scope of Copyright	101
2.	Copyright Ownership and Transfer	201
3.	Duration of Copyright	301
4.	Copyright Notice, Deposit, and Registration	401
5.	Copyright Infringement and Remedies	501
6.	Manufacturing Requirement[1] and Importation	601
7.	Copyright Office	701
8.	Copyright royalty Tribunal	801
9.	*Protection of Semiconductor Chip Products*	*901*

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CHAPTER 9—PROTECTION OF SEMICONDUCTOR CHIP PRODUCTS

Sec.
901. Definitions.
902. Subject matter of protection.
903. Ownership and transfer.
904. Duration of protection.
905. Exclusive rights in mask works.
906. Limitation on exclusive rights: reverse engineering; first sale.
907. Limitation on exclusive rights: innocent infringement.
908. Registration of claims of protection.
909. Mask work notice.
910. Enforcement of exclusive rights.
911. Remedies for infringement.
912. relation to other laws.

§ 901. Definitions

As used in this chapter—

(1) a "semiconductor chip product" is the final or intermediate form of any product—

(A) having two or more layers of metallic, insulating, or simiconductor material deposited or otherwise placed on, or etched away or otherwise removed from, a piece of semiconductor material in accordance with a predetermined pattern; and

(B) that is intended to perform electronic circuitry functions;

(2) a "mask work" means the 2-dimensional and 3-dimensional features of shapes, pattern, and configuration of the surface of the layers of a semiconductor chip product, regardless of whether such features have an intrinsic utilitarian function that is not only to portray the appearance of the product or to convey information;

(3) a mask work is "fixed" in a semiconductor chip product when its embodiment in the product, by or under the authority of the owner of the mask work, is sufficiently permanent or stable to permit the mask work to be perceived, reproduced, or otherwise communicated for a period of more than transitory duration;

(4) a mask work is "original" if it is the independent creation of an author who did not copy it from another source;

(5) to "commercially exploit" a mask work is to sell, offer for sale after the mask work is fixed in a semiconductor chip product, or otherwise distribute to the public for profit semiconductor chip products embodying the mask work;

(6) the "owner" of a mask work is the author of the mask work, the legal representatives of a deceased author or of an author under a legal incapacity, the employer of an author who created the mask work for the employer in the case of a work made within the scope of the author's employment, or a person to whom the rights of the author or of such employer are transferred in accordance with this chapter;

(7) an "innocent purchaser" is a person who purchases a semiconductor chip product in good faith and without having notice of protection with respect to that semiconductor chip product;

(8) having "notice of protection" means having actual knowledge that, or reasonable grounds to believe that, a mask work fixed in a semiconductor chip product is protected under this chapter; and

(9) an "infringing semiconductor chip product" is a semiconductor chip product which is made, imported, or distributed in violation of the exclusive rights of the owner of a mask work under this chapter.

§ 902. Subject matter of protection

(a)(1) An original mask work fixed in a semiconductor chip product is eligible for protection under this chapter if—

(A) on the date on which the mask work is registered under section 908, or the date on which the mask work is first commercially exploited, whichever occurs first, the owner of the mask work is a national or domiciliary of the United States, or is a national, domiciliary, or sovereign authority of a foreign nation that is a party to a treaty affording protection to mask works to which the United States is also a party, or is a stateless person, wherever that person may be domiciled;

(B) the mask work is first commercially exploited in the United States; or

(C) the mask work comes within the scope of a Presidential proclamation within the scope of a Presidential proclamation issued under paragraph (2).

(2) Whenever the President finds that a foreign nation extends, to mask works of owners who are nationals or domiciliaries of the United States or to mask works on the date on which the mask works are registered under section 908, or the date on which the mask works are first commercially exploited, whichever occurs first, protection (A) on substantially the same basis as that on which the foreign nation extends protection to mask works of its own nationals and domiciliaries and mask works first commercially exploited in that nation, or (B) on substantially the same basis as provided in this chapter, the President may by proclamation extend protection under this chapter to mask works (i) of owners who are, on the date on which the mask works are registered under section 908, or the

date on which the mask works are first commercially exploited, whichever occurs first, nationals, domiciliaries, or sovereign authorities of that nation, or (ii) which are first commercially exploited in that nation.

(b) Protection under this chapter shall not be available for a mask work that—

(1) is not original; or

(2) consists of designs that are staple, commonplace, or familiar in the semiconductor industry, or variations of such designs, combined in a way that is not original.

(c) In no case does protection under this chapter for a mask work extend to any idea, procedure, process, system, method of operation, concept, principle, or discovery, regardless of the form in which it is described, explained, illustrated, or embodied in the mask work.

§ 903. Ownership and transfer

(a) The exclusive rights in a mask work subject to protection under this chapter shall vest in the owner of the mask work.

(b) The exclusive rights in a mask work registered under section 908, or a mask work for which an application for registration has been or is eligible to be filed under section 908, may be transferred in whole or in part by any means of conveyance or by operation of law, and may be bequeathed by will or pass as personal property by the applicable laws of intestate succession.

(c) In any case in which conflicting transfers of the exclusive rights in a mask work are made, the transfer first executed shall be void as against a subsequent transfer which is made for a valuable consideration and without notice of the first transfer, unless the first transfer is recorded in the Copyright Office within three months after the date on which it is executed, but in no case later than the day before the date of such subsequent transfer.

(d) Mask works prepared by an officer or employee of the United States Government as part of that person's official duties are not protected under this chapter, but the United States Government is not precluded from receiving and holding exclusive rights in mask works transferred to the Government under subsection (b).

§ 904. Duration of protection

(a) The protection provided for a mask work under this chapter shall commence on the date on which the mask work is registered under section 908, or the date on which the mask work is first commercially exploited, whichever occurs first.

(b) Subject to the provisions of this chapter, the protection provided under this chapter to a mask work shall continue for a term of ten years beginning on the date on which such protection commences under subsection (a).

§ 905. Exclusive rights in mask works

Subject to the other provisions of this chapter, the owner of a mask work has the exclusive rights to do and to authorize any of the following:

(1) to reproduce the mask work by optical, electronic, or any other means;

(2) to import or distribute a semiconductor chip product in which the mask work is embodied; and

(3) to induce or knowingly to cause another person to do any of the acts described in paragraphs (1) and (2).

§ 906. Limitation on exclusive rights: reverse engineering; first sale

(a) Notwithstanding the provisions of section 905(1), it is not an infringement of the exclusive rights of the owner of a mask work to reproduce the work solely for the purpose of teaching, analyzing, or evaluating the concepts or techniques embodied in the mask work or the circuitry or organization of components used in the mask work.

(b) Notwithstanding the provisions of section 905(2), the owner of a particular semiconductor chip product lawfully made under this chapter, or any person authorized by such owner, is entitled, without the authority of the owner of the mask work, to sell or otherwise dispose of that semiconductor chip product.

§ 907. Limitation on exclusive rights: innocent infringement

(a) Notwithstanding any other provision of this chapter, an innocent purchaser of an infringing semiconductor chip product—

(1) shall incur no liability under this chapter with respect to the distribution of units of the infringing semiconductor chip product that occurred before that innocent purchaser had notice of protection with respect to that semiconductor chip product; and

(2) shall be liable only for a reasonable royalty on each unit of the infringing semiconductor chip product that the innocent purchaser distributed after having notice of protection with respect to that semiconductor chip product.

The amount of the royalty referred to in paragraph (2) shall be determined by voluntary negotiation between the parties, mediation, or binding arbitration, or, if the parties do not resolve the issue, by the court in a civil action for infringement.

(b) The immunity from liability and limitation on liability referred to in subsection (a) shall apply to any person who directly or indirectly purchases an infringing semiconductor chip product from an innocent purchaser.

(c) The provisions of subsections (a) and (b) apply only with respect to units of an infringing semiconductor chip product that an innocent purchaser purchased before having notice of protection with respect to that semiconductor chip product.

§ 908. Registration of claims of protection

(a) Protection of a mask work under this chapter shall terminate if application for registration of a claim of protection in the mask work is not made as provided by this chapter within two years after the date on which the mask work is first commercially exploited.

(b) The Register of Copyrights shall be responsible for all administrative functions and duties under this chapter. Except for section 708, the provisions of chapter 7 of this title relating to the general responsibilities, organization, regulatory authority, actions, records, and publications of the Copyright Office shall apply to this chapter, except that the Register of Copyrights may make such changes as may be necessary in applying those provisions to this chapter.

(c) The application for registration of a mask work shall be made on a form prescribed by the Register of Copyrights and shall include

any information regarded by the Register of Copyrights as bearing upon the preparation or identification of the work, the existence or duration of protection, or ownership of the work.

(d) The Register of Copyrights shall by regulation set reasonable fees for the filing of applications to register claims of protection in mask works under this chapter, and for other services relating to the administration of this chapter or the rights under this chapter, taking into consideration the cost of providing those services, the benefits of a public record, and statutory fee schedules under this title. The Register shall also specify the identifying material to be deposited in connection with the claim for registration.

(e) If the Register of Copyrights, after examining an application for registration, determines, in accordance with the provisions of this chapter, that the application relates to a mask work which warrants protection under this chapter, then the Register shall register the claim and issue to the applicant a certificate of registration of the claim under the seal of the Copyright Office. The effective date of registration of a claim of protection shall be the date on which an application, deposit, and fee, which are determined by the Register of Copyrights or by a court of competent jurisdiction to be acceptable for registration, have all been received in the Copyright Office.

(f) In any action for infringement under this chapter, the certificate of registration of a mask work shall constitute prima facie evidence (1) of the facts stated in the certificate, and (2) that the applicant issued the certificate has met the requirements of this chapter, and the regulations issued under this chapter, with respect to the registration of claims.

(g) Any applicant for registration under this section who is dissatisfied with the refusal of the Register of Copyrights to issue a certificate of registration under this section may seek judicial review of that refusal by bringing an action for such review in an appropriate United States district court, in accordance with chapter 7 of title 5, not later than sixty days after the refusal. The failure of the Register of Copyrights to issue a certificate of registration within three months after an application for registration is filed shall be deemed to be a refusal to issue a certificate of registration for purposes of this subsection and section 910(c).

§ 909. Mask work notice

(a) The owner of a mask work provided protection under this chapter may affix notice to the mask work or to the semiconductor chip product embodying the mask work in such manner and location as to give reasonable notice of such protection. The Register of Copyrights shall prescribe by regulation, as examples, specific methods of affixation and positions of notice for purposes of this section, but these specifications shall not be considered exhaustive. The affixation of such notice is not a condition of protection under this chapter, but shall constitute prima facie evidence of notice of protection.

(b) The notice referred to in subsection (a) shall consist of—

(1) the words "mask work," or the letter M in a circle Ⓜ*;*

(2) the year in which the mask work was first fixed in a semiconductor chip product; and

(3) the name of the owner or owners of the mask work or an abbreviation by which the name is recognized or is generally known.

§ 910. Enforcement of exclusive rights

(a) Except as otherwise provided by this chapter, any person who violates any of the exclusive rights of the owner of a mask work under this chapter shall be liable as an infringer of such rights.

(b) The owner of a mask work protected under this chapter shall be entitled to institute a civil action for infringement after a certificate of registration of a claim in that mask work is issued under section 908.

(c) In any case in which an application for registration and the required deposit and fee have been received in the Copyright Office in proper form and registration of the mask work has been refused, the applicant is entitled to institute a civil action for infringement under this chapter if notice of the action, together with a copy of the complaint, is served on the Register of Copyrights, in accordance with the Federal Rules of Civil Procedure. The Register may, at his or her option, become a party to the action with respect to the issue of whether the claim is eligible for registration by entering an appearance within sixty days after such service, but the failure of the Register to become a party to the action shall not deprive the court of jurisdiction to determine that issue.

(d)(1) The Secretary of the Treasury and the United States Postal Service shall separately or jointly issue regulations for the enforcement of the right to import set forth in section 905. These regulations may require, as a condition for the exclusion of articles from the United States, that the person seeking exclusion—

(A) obtain a court order enjoining, or an order of the International Trade Commission under section 337 of the Tariff Act of 1930 excluding, importation of the articles; or

(B) furnish proof that the mask work involved is protected under this chapter and that the importation of the articles would infringe the rights in the mask work under this chapter, and also post a surety bond for any injury that may result if the detention or exclusion of the articles proves to be unjustified.

(2) Articles imported in violation of the right to import set forth in section 905 are subject to seizure and forfeiture in the same manner as property imported in violation of the customs laws. Any such forfeited articles shall be destroyed as directed by the Secretary of the Treasury or the court, as the case may be, except that the articles may be returned to the country of export whenever it is shown to the satisfaction of the Secretary of the Treasury that the importer had no reasonable grounds for believing that his or her acts constituted a violation of the law.

§ 911. Remedies for infringement

(a) Any court having jurisdiction of a civil action arising under this chapter may grant temporary and permanent injunctions on such terms as the court may deem reasonable to prevent or restrain infringement of the exclusive rights in a mask work under this chapter.

(b) Upon finding for the owner of the mask work, the court shall award the owner actual damages suffered by the owner as a result of the infringement. The court shall also award the owner the infringer's profits that are attributable to the infringement and are not taken into account in computing the award of actual damages. In establishing the infringer's profits, the owner of the mask work is required to present proof only of the infringer's gross revenue, and the infringer is required to prove his or her deductible expenses and the elements of profit attributable to factors other than the mask work.

(c) At any time before final judgment is rendered, the owner of the mask work may elect, instead of actual damages and profits as provided by subsection (b), an award of statutory damages for all infringements involved in the action, with respect to any one mask work for which any one infringer is liable individually, or for which any two or more infringers are liable jointly and severally, in an amount not more than $250,000 as the court considers just.

(d) In any action for infringement under this chapter, the court in its discretion may allow the recovery of full costs, including reasonable attorneys' fees, to the prevailing party.

(e) An action for infringement under this chapter shall not be maintained unless the action is commenced within three years after the claim accrues.

(f) As part of a final judgment or decree, the court may order the destruction or other disposition of any infringing semiconductor chip products, and any masks, tapes, or other articles by means of which such products may be reproduced.

§ 912. Relation to other laws

(a) Nothing in this chapter shall affect any right or remedy held by any person under chapters 1 through 8 of this title, or under title 35.

(b) Except as provided in section 908(b) of this title, references to "this title" or "title 17" in chapters 1 through 8 of this title shall be deemed not to apply to this chapter.

(c) The provisions of this chapter shall preempt the laws of any State to the extent those laws provide any rights or remedies with respect to a mask work which are equivalent to those provided by this chapter, except that such preemption shall be effective only with respect to actions filed on or after January 1, 1986.

(d) The provisions of sections 1338, 1400(a), and 1498 (b) and (c) of title 28 shall apply with respect to exclusive rights in mask works under this chapter.

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APPENDIX A

A SUMMARY COMPARISON OF H.R. 1028 (COPYRIGHT ACT PROTECTION) AND H.R. 5525 (SUI GENERIS CHAPTER 9 PROTECTION)

H.R. 1028	H.R. 5525
1. Amends Copyright Act, title 17 Chapters 1 through 8	Creates new form of legal protection in separate, independent Chapter 9 of title 17 U.S. Code; specific declaration in section 912 of the complete separation between "Chapter 9 rights" and the copyright and patent statutes.

A SUMMARY COMPARISON OF H.R. 1028 (COPYRIGHT ACT PROTECTION) AND H.R. 5525 (SUI GENERIS CHAPTER 9 PROTECTION)—Continued

H.R. 1028	H.R. 5525
2. Standard of protectability: "original works of authorship;" must meet same standard as other copyrightable subject matter.	Original—consists of more than staple, commonplace or familiar designs in the semiconductor industry, or mere variations or unoriginal combinations thereof.
3. Constitutional basis: specific declaration that chip product may be either a writing or a discovery, or the manufacture, use, or distribution of which is in or affects commerce. No comparable statement re "mask work." (Note that there is a conflict between the reference to "discovery" and the prohibition against protection for a "discovery" in 17 U.S.C. 102(b)).	Declaration in legislative committee report that "mask works" are writings under Article I, Section 8, Clause 8; finding that Commerce Power is an alternative constitutional basis.
4. Definitions: Definitions of "semiconductor chip product," "mask work," and "mask". Unclear which definitions of 17 U.S.C. 101 apply; questions arise, especially, regarding the critical term "copy"—the bill lists only 9 sections of 17 U.S.C. in which "copy" includes a semiconductor chip product; section 101, in which copy is defined, is not one of the nine.	Same definition of semiconductor chip product except Clause (3) is dropped; new definition of "mask work; definitions of the Copyright Act do not apply.
5. Exclusive rights: New rights to embody the mask work in a mask and to distribute a mask embodying the mask work; to use a mask embodying the mask work to make a chip product; in the manufacture of a chip product, substantially to reproduce images of the mask work on material intended to be a part of the chip product; and to distribute or use a chip product embodying the mask work or in whose manufacture images of the mask work were substantially reproduced on material intended to be part of the chip product.	To reproduce the mask work by optical, electronic, or any other means; to import or distribute chip products embodying the mask work; and to induce or knowingly to cause infringement of "Chapter 9 rights."
6. Reverse engineering: No reverse engineering provision (Note: Representative Edwards' detailed analysis of H.R. 1028 appearing at 129 Congressional Record H-645 (February 24, 1983) makes clear that the intent of the bill's sponsors was not to interfere with use of a chip for reverse engineering).	Specific provision that reverse engineering is not an infringement.
7. Compulsory license: Created for benefit of purchaser without notice of infringement, who committed substantial funds to use chip, where equity requires further use privilege.	No compulsory license: but see innocent purchaser provision.
8. Duration: 10 years from the first authorized distribution, use in a commercial product, or manufacture in commercial quantities in chips.	10 years from date the mask work is registered or date of first commercial exploitation, whichever occurs first.
9. Method of obtaining protection: Copyright from creation; notice of copyright required on publicly distributed copies in visually perceptible form.	Mandatory registration—inchoate protection for two years from fixation without any formalities; but unless registration is made within that period, all protection is lost.
10. Notice of copyright: Same requirement applies as for all copyrightable subject matter; if notice is omitted from publicly distributed copies or phonorecords, protection is lost unless registration is made before or within 5 years of publication, and other curative steps are taken.	Notice is optional; it is not a condition of protection but has evidentiary value; registration is the only formality that is a condition of protection; this means that the Universal Copyright Convention will clearly not be applicable to mask works (since the UCC notice is the sole formality permitted as a condition of protection).
11. Innocent infringement: good faith purchaser of chip product without notice of infringement is not liable for distribution of chip products before notice of infringement. Query liability for infringing acts other than distribution.	Innocent purchaser is not liable for distribution of protected work before having notice of protection; after notice of protection, liability limited to reasonable royalty.
12. Remedies: Existing remedies of the Copyright Act	Comparable civil remedies except new $250,000 statutory damage maximum; no general criminal infringement penalty.
13. Effective date: Effective 90 days after date of enactment but specifically does not apply to chips or masks manufactured in or imported into the U.S. before the effective date, or chips manufactured in the U.S. by means of masks made in or imported into the U.S. before the effective date.	January 1, 1985.

A SUMMARY COMPARISON OF H.R. 1028 (COPYRIGHT ACT PROTECTION) AND H.R. 5525 (SUI GENERIS CHAPTER 9 PROTECTION)—Continued

H.R. 1028	H.R. 5525
14. Retroactivity: Uncertainty about retroactive effect	Protection for works commercially exploited before effective date but no earlier than January 1, 1984, provided registration is made by January 1, 1986:; remedy limited to reasonable royalty for infringing chip products manufactured before the effective date.
15. Registration system: No examination of prior art; examination for copyrightable subject matter and compliance with legal and formal requirements.	Similar system. No examination of prior art.
Registration optional but prerequisite to infringement action.	Registration is mandatory within two years of commercial exploitation.
Certificate of registration is prima facie evidence of the validity of the copyright, if registration is timely made.	Certificate of registration is prima facie evidence (1) of the facts, and (2) that the requirements of chapter 9 and any regulation with respect to registration, "have been met.
16. Fees: 10 dollars	Fixed by the Register of Copyrights based on these factors: cost, benefit of public record, and statutory fee schedule for registration of copyrighted works.

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